# Notes

#### You should adjust your counterplan text and actor (from DOD to a specific branch of the military, like the Navy) if the solvency evidence is specific to that.

#### There is an optional plank you can add to the counterplan that has the DOD share energy technology and innovations with China --- this could include any energy that might developed as part of the plan / counterplan (if the plan is energy related). You could also use this plank to solve China / Climate / Asia advantages or to bolster the spillover benefits of renewable or energy technologies.

# Military CP

### 1nc DOD CP vs Exploration Affs

#### The United States Department of Defense should \_\_\_\_\_\_\_\_\_\_.

#### The navy can explore the ocean better than any other actor --- can release data to others

Broad ’95 (11/28/95, William J., The New York Times, “Navy Is Releasing Treasure of Secret Data on World's Oceans”, <http://www.nytimes.com/1995/11/28/science/navy-is-releasing-treasure-of-secret-data-on-world-s-oceans.html?src=pm&pagewanted=1>)

THE Navy is starting to release a treasure trove of physical data about the sea that was gathered in secrecy during the long decades of the cold war, exciting scientists who see it as a bonanza for understanding environmental change.

The riches include readings on ice depth, ice shape, ocean depth, sediment composition, sea-surface height, salinity, seabed magnetics, water temperature, bioluminescence and light transmissibility. Over the decades, the Navy deployed thousands of ships, airplanes, submarines and satellites to collect such data. Usually kept secret, the information was viewed as vital to the quiet war against the Soviet Union, helping submariners glide stealthily through the sea and hunt out the hidden assets of their adversaries.

Today, such archival readings are seen as unrivaled yardsticks for judging long-term processes like global climatic change and planetary warming. Indeed, the Navy keeps decades of detailed readings on the thickness of the Arctic icecap, which is considered one of the most sensitive and reliable indicators of global temperature change.

"The Navy holds much more data on the past state of the oceans than the civilian community could ever hope to get hold of," said Dr. Gordon J. MacDonald, a geophysicist at the University of California at San Diego. "The value of that data is measured in tens of billions of dollars."

The release of naval data has been championed by Vice President Al Gore and Medea, a group set up by Mr. Gore that is headed by Dr. MacDonald and is made up of about 60 scientists from academia and industry who advise the nation's intelligence agencies on how secret data can be used to study the environment. Medea stands for Measurements of Earth Data for Environmental Analysis.

The release of the data is part of a broader push throughout the Federal Government to turn cold war assets to good use. While the focus of the naval effort is historical, dealing with past data, a related effort also championed by the Medea group is now redirecting the nation's spy satellites to spend part of their time snooping on nature to detect environmental shifts.

The Medea group's lobbying already prompted the Navy this summer to release gravity measurements of the world's sea floors, which civilian oceanographers promptly turned into the first good map of the global seabed. Although a major milestone, that represented just a tiny fraction of the secret and sequestered data now scheduled for public release.

"It's a real event in the history of oceanography," said Dr. Walter Munk, a member of Medea who is a leading scientist at the Scripps Institution of Oceanography in San Diego.

Dr. Edward C. Whitman, technical director of the Office of the Oceanographer of the Navy, said perhaps 95 percent of the Navy's physical data would eventually be made public. Studies that weigh the risks and benefits to national security are nearly complete, he said, adding that there is little or no chance of foot dragging.

"There's a lot of pressure on the Navy to release this stuff coming from the very highest levels of the Government," Dr. Whitman said in an interview. "And that will move us to make a decision."

Some of the data are considered sensitive because they reveal information of military importance like the exact routes of warships and submarines and disclose patrol zones and patterns. In other cases, the public release of data acquired inconspicuously in the coastal waters of foreign nations might prove embarrassing. The Navy says it is considering ways to make the public release as large as possible, in some cases by declassifying only data summaries or data from certain geographic regions.

Presumably some of the data were gathered by submarines that trespassed into territorial waters of friendly and unfriendly states, though the Navy admits no such thing. These nations may be appalled by the public release of data about their submerged territories, yet in theory such information could be a potential gold mine available at no cost, courtesy of the United States Navy.

The Navy's oceanographic data holdings are so rich and varied that they are expected to advance many fields beyond environmental studies, including geology, climatology, weather forecasting, pollution studies, marine engineering, commercial fisheries management and deep oil and mineral exploration.

The riches are appraised in a 52-page report published by the Medea group in June, titled "Scientific Utility of Naval Environmental Data." The 11-member panel that wrote the report was headed by Dr. Otis B. Brown of the University of Miami.

In a forward to the report, Dr. MacDonald said the release of the secret naval data would aid not only civilians but also the military because wide analysis would inevitably "strengthen the Navy's overall capabilities to understand and utilize the oceans in addressing its national security responsibilities."

These are some of the data proposed for release and the Medea group's assessment of their importance:

\*Marine gravity. Large seabed features like deep rifts and high mountain ranges exert gravitational influences on surface waters miles above, and these influences can be read with sensitive instruments. The gravity data that were recently released came from a Navy satellite that in the 1980's made gravity measurements over all the world's oceans as part of a quiet effort to increase the accuracy of long-range missiles fired from submarines. But in addition to that effort, fleets of Navy ships spent decades making even more detailed gravity measurements in certain parts of the seas. These are now up for declassification.

The Medea group's report said that their release would throw much new light on geology, including the volcanic workings of midocean ridges, the variations of crust thickness and the structure of puzzling fracture zones that run perpendicular to the ocean ridges.

\*Geomagnetics. For decades, the Navy made wide surveys of seabed magnetism, partly for purposes of navigation. The Medea group said that the release of these data would improve navigational safety and aid understanding of the evolution of the earth's crust, since over the ages bands of volcanically erupted seabed became magnetized in different ways as they cooled. The data, the Medea report said, would also illuminate the workings of the earth's core and inner regions that are responsible for the planet's magnetic field.

\*Seafloor sediments. The Navy conducted a global program to determine sea floor sediment types and thicknesses, partly to understand how sound echoed off the bottom and to improve its tracking of enemy ships and submarines. The Medea report said release of such data would aid the search for manganese nodules, titanium deposits, oil-saturated sediments and salt domes that act as petroleum traps. More generally, it would aid the understanding of how currents act to speed erosion and deposition.

\*Ice shape and depth. The Navys amassed huge amounts of information on the frigid Arctic because it was a main theater for the deadly serious hide-and-seek games of nuclear-armed submarines from East and West. Arctic ice was both a hazard and a haven, its jagged downward spikes threatening to pierce submarines as well as providing visual and acoustic cover. In the silent war, the Soviets tried to hide their missile-carrying subs under the icecap while American attack submarines tried to track them closely, ready to destroy them if the war turned hot.

The Medea group said decades of ice data promised to be a major aid in pinning down the reality of global warming, in studying fluctuations in climate, in forecasting ice conditions and in calibrating civilian satellite sensors that pass over polar regions.

\*Marine bathymetry. For decades Navy ships crisscrossed the sea to map the inky darkness of its lower regions by bouncing sound waves off the bottom. Such seabed maps were used for everything from navigation to understanding current flow and sound propagation. In general, they are much sharper than the civilian ones recently made from gravity readings. The Medea group said the maps would greatly aid the understanding of seabed geology and evolution and would pinpoint such seabed features as undersea volcanoes.

\*Temperature and salinity fields. Since 1900, the Navy has carefully gathered global data on ocean temperatures and salinities, two measures that are closely intertwined. Among the Navy's uses for such data were understanding the propagation of sound through the sea, which aided the detecting of enemy submarines at great distances. The Medea report said the release of such data would greatly aid climate studies.

\*Ocean optics and bioluminescence. The Navy made global measurements to determine light transmissibility for such things as knowing the potential for the visual detection of underwater objects and for such studies as laser depth readings. The Medea group said the release of such data would aid the design of satellite sensors.

Among its recommendations, the Medea report called for the creation of an "exploitation center" for the released data at the Stennis Space Center at Bay Saint Louis, Miss., which is also the headquarters of the Naval Oceanographic Office.

Dr. Landry J. Bernard, technical director of the Naval Oceanographic Office, said in an interview that 10 to 20 percent of the data had been declassified and that much more was on the way. He said historical data on ocean temperature and salinity began to be released in the past four or five years, after the cold war. "That's when we really got active" in opening up the Navy's endless archives of oceanographic data, he said.

As for the future, Dr. Bernard said: "We're taking a proactive role. It's, 'When in doubt, release.' If you can't make a good case for it being classified, then it's open, whereas before it was the other way around, to keeping it secret."

### 1nc DOD CP vs Energy Affs

#### The United States Department of Defense should \_\_\_\_\_\_\_\_\_\_.

#### DOD has a proven track record on renewables and leads to broader commercialization

McCain 12, Steve McCain is a retired Air Force Colonel who coordinates the national security and energy public policy practice at K&L Gates, , <http://energy.nationaljournal.com/2012/05/powering-our-military-whats-th.php#2212572> MWimsatt

No entity in government knows better than the Department of Defense (DoD) that the lack of energy security poses a national security threat to the United States. The geostrategic importance of energy has long been recognized. As the federal government's largest energy user, DoD also has a huge stake in reducing our dependence on unreliable supplies of energy and securing low-cost power. Clean energy can and should be an important element of any such national energy/security policy. Academia and the mainstream media exhort the populace to act now to develop alternatives to our current energy practices, and yet solutions seem slow to emerge. The DoD is well-positioned to be a leader on clean energy development, and has historically been an early adopter of new technologies. The Pentagon, for example, should seek to leverage smart microgrids, advanced biofuels, energy storage, solar, ocean, wind, geothermal, nuclear and other innovative technologies to reduce our vulnerability to foreign sources of power and energy. Although many suggest that Secretary Panetta should not be taking a lead role in alternative energy, DoD, in cooperation with the Departments of Agriculture and Energy, can catalyze market actions and accelerate the commercialization of viable, sustainable energy solutions (such as drop-in biofuels) for the warfighter and Americans more broadly. DoD should not withdraw from recent opposition to its alternative energy initiatives; a kite rises against the wind. Investment by the military in alternative energy technologies, even in times of constrained budgets, can produce needed return on investment over the coming years. DoD rightly seeks to improve its public-private financing processes and procedures. As defense budgets decline, efforts to improve energy efficiency and reduce the agency’s huge energy costs are ever more important. Among federal agencies, DoD has a proven track record of managing complex systems and supply chains, and working to apply the work of research laboratories toward real-world applications. Although it's tempting to play politics with the “energy issue” in an election year, we should not wait to overcome a challenge so pivotal to the future success of our nation. Private industry will provide the lion’s share of clean energy investment, but DoD can carefully augment these initiatives to resolve military requirements for lighter, more portable power sources, cleaner and more energy dense fuels, and reliable cost-effective energy solutions for our facilities at home and our forward operating locations abroad. Americans are starting to connect the dots between energy, security and our future, while other countries are seeking an edge in alternative energy production. A national energy policy that leverages U.S. innovation and our vast natural resources is vital to our continued economic prosperity and national security. If we can reach a unified vision, we are poised to lead the world's clean energy economy.

#### Structured network of relationships allows global tech diffusion and modelling --- there will be an immediate perception of credibility

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

C. The Green Arms Race and the Globalization of Unconventional Energy The United States military interacts with foreign militaries in many ways, whether through active combat operations, training exercises, foreign military sales cases, or disaster relief and humanitarian assistance missions. Each of these interactions creates a structured network of global relationships. These powerful and largely anonymous structures are utilized to transfer technology and regulation among countries in the absence of a formal multilateral agreement. These relationships hold the key to globalizing the demand for clean energy. While states are still the primary actors on the international plane, their power has been disaggregated to their constituent parts. Individuals now can negotiate with their foreign counterparts with no need for interstate-negotiation. Anne-Marie Slaughter argues that network relationships are the "new world order," stating: Disaggregating the state into its functional components makes it possible to create networks of institutions engaged in a common enterprise even as they represent distinct national interests. Moreover, they can work with their subnational and supranational [\*691] counterparts, creating a genuinely new world order in which networked institutions perform the functions of a world government--legislation, administration, and adjudication--without form. n112 Interaction within the informal network strengthens domestic institutions and international organizations. Direct interaction between regulators across the globe facilitates the spread of effective regulatory mechanisms and technology between jurisdictions. Cooperation within the network is achieved through the convergence of best practices fostered through repeated interaction and emulation. n113 Networks provide the venue for this interaction and the transfer of information between subject matter experts. Networks can establish themselves in many contexts. They can occur formally within international organizations or through informal agreements between interested bureaucrats themselves. n114 These networks can encourage cooperation in the absence of a treaty, or pave the way for a new agreement by creating convergence around successful and effective technologies and regulatory policies. n115 Most importantly for our inquiry, networks facilitate the multilateral sharing of knowledge and ideas between nations. Informational networks are incredibly useful for distilling best practices to solve problems of mutual interest. n116 This distillation of best practices makes domestic regulation more efficient and international cooperation more durable. In the defense context, efforts to better meet mission requirements and create a more efficient and effective fighting force can be exported to our international partners through networks. Repeated interaction between defense experts can create "convergence through technical assistance and training." n117 The United States wields the most powerful military force on the globe. A cultural change that makes the United States military more efficient and capable will garner attention and have immediate credibility among foreign experts. Changes in United States law, regulation, and military practice can be transferred through formal alliances like NATO; the Australia, New Zealand, and United States Security Treaty ("ANZUS"); [\*692] Republic of Korea Treaty; or through informal interactions and information transfers. These interactions will also provide feedback on the United States' regulatory schemes and technologies, which may uncover new and more efficient methods to facilitate energy innovation. The Navy-Marine Corps team's global presence is in a prime position to promote the quest for clean energy innovation. As Navy and Marine Corps forces operate throughout the world, whether using ExFOB fielded technology in forward deployed areas or sailing the Great Green Fleet to participate in disaster relief operations, this effect will be compounded. These interactions will create global requirements and reshape military forces around a new energy paradigm. This new model for energy innovation has already started to spread. As mentioned above, the Rim of the Pacific is the world's largest maritime exercise. It is designed to "provide a unique training opportunity that helps participants foster and sustain cooperative relationships that are critical to ensuring the safety of sea lanes and security on the world's oceans." n118 Twenty-two nations, including Canada, Australia, India, Japan, Philippines, Singapore, Thailand, Malaysia, Russia, New Zealand, the United Kingdom, and South Korea participated in 2012, bringing forty surface ships, six submarines, more than 200 aircraft, and 25,000 personnel. n119 During the exercise in 2012, the Royal Australian Navy ("RAN") signed an agreement to partner with the United States to explore the increased use of alternative fuels. RAN Fleet Commander, Rear Admiral Tim Barrett, AM, CSC, RAN, delivered the Statement of Cooperation to Secretary Mabus on board the aircraft carrier USS Nimitz. n120 The Fleet Commander landed on the USS Nimitz and refueled his helicopter with a biofuel blend. n121 His flight back to his ship HMAS Darwin, after the signing ceremony, marked the first time an RAN aircraft flew with a biofuel blend. n122 In accordance with the Statement of Cooperation, the RAN will partner with the United States Navy and further develop alternative fuels for use during a joint deployment in 2016. n123 During this demonstration, the [\*693] United States Navy will sail the Great Green Fleet across the Pacific to Australia to commemorate the arrival of the Great White Fleet in Sydney harbor in 1907. n124 The Great Green Fleet will then refuel with biofuels made in Australia for the return journey. n125 Demand by two large naval forces will send a strong signal to the emerging advanced biofuels industry. Emerging nations, not wanting to fall behind on the future battlefield, will work towards similar gains. So starts the Green Arms Race. The demand for clean energy innovation, passed through networked interactions between defense experts, is spreading across the globe. The United States Defense and State Departments, in their constant interactions with their foreign counterparts, facilitate the transfer of successful efficient energy regulation and technology. Once successful technologies and regulatory schemes are validated by global defense interaction, they will spill over into the commercial market. The progeny of the Green Arms Race will be more efficient fighting forces, increased heterogeneity in the sources of energy, and a change in direction of the global resource quest. American leadership in clean and efficient energy innovation will create a more stable world order and align the once disparate approaches to climate change, energy dependence, and national security. Military energy innovation, shared through existing and newly forming defense networks, can reveal strong avenues for increased international military and diplomatic interaction. To be most successful, the Green Arms Race must involve the two largest consumers of energy on the planet.

### 1nc DOD CP --- Optional China Coop Plank

#### The DOD should also increase direct military-to-military interaction with China and our allies in the Asia-Pacific region specifically on the issue of energy innovation.

#### The counterplan stabilizes U.S. global leadership, boosts U.S.-China relations, ensures worldwide spread of military clean tech developments and solves warming

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

The Asia-Pacific is the world's fastest growing region and a key driver of global politics. n5 With over 4.2 billion people, the Asia-Pacific is home to nearly sixty percent of the world's population n6 and more than half of the global economy. n7 The seas from the Indian Ocean, through the Strait of Malacca, and the Pacific contain the world's most vibrant trade and energy routes. n8 In this critically important region, our allies and partners are looking for American leadership. In late 2011, the Obama administration announced a strategic rebalancing of U.S. resources toward the Asia-Pacific region. n9 In his speech to the Australian Parliament, President Obama signaled this broad shift: Here [in the Asia-Pacific region], we see the future. As the world's fastest-growing region--and home to more than half the global economy--the Asia-Pacific is critical to achieving my highest priority, and that's creating jobs and opportunity for the American people. With most of the world's nuclear power and some half of humanity, Asia will largely define whether the century ahead will be marked by conflict or cooperation, needless suffering or human progress. n10 After heavy investment over the last thirteen years in the Middle East and Central Asia, the United States is shifting its attention east. The interrelated issues of energy and the environment will play a key role in this strategic rebalancing. Energy use is directly correlated to wealth. As nations like China and India continue to grow they will seek an increasing share of the world's energy resources. These quests that may range to far-flung places across the globe will cause friction as competition for energy increases. As the world's Default Power, the United States will [\*675] have to provide enhanced presence, mediate disputes, and find lasting solutions to the difficult problems that will satisfy the countries in the region. Rapid growth in the Asia-Pacific region is affecting global energy markets. The U.S. Energy Information Administration estimates that China and India will account for half the world's total increase in energy use through 2040. To fuel its growth, China, just as the West did during the Industrial Revolution, n11 is turning primarily to coal, n12 installing more than fifty gigawatts of coal energy capacity per year. n13 Coal is cheap and, along with other fossil fuels, provides emerging economies the surest path towards sustained growth. This increase in the use of fossil fuels will also have a big impact on the environment.How the United States manages the dynamic global energy landscape in the Pacific region and addresses the threats to our climate will be important measures of American leadership in the years to come. If China follows the same path towards development as the West, cutting emissions only after growth, the results for the planet will be disastrous. Likewise, if China and other rising Asian powers clash in a competition for resources, the result of worldwide economic stability and the preservation of humanity could be equally destructive. Yet these realities, while grave, offer the United States an opportunity to lead in a way that contributes to global stability while positively impacting the vexing problem of environmental damage from the rapid industrial growth in China and the Asia-Pacific region. I propose that the United States use its strategic pivot in the Asia-Pacific region to increase direct military-to-military interaction with China and our regional allies specifically on the issue of energy innovation. These interactions will forge a new energy future for the region and the world.Energy and the environment are profound issues to U.S. national security and foreign policy. Energy shapes interests and relations between countries. When it is seen through the national security lens, rather than as a fringe environmental pursuit, climate change becomes a "threat multiplier," and an energy policy that promotes heterogeneity and efficiency becomes a [\*676] "force multiplier." n14 Further, viewing energy policy in the national security context allows us to examine the opportunity that defense sector-led energy innovation provides as a vehicle to engage China. Engagement on these issues of common interest will increase regional stability. Further, with Chinese, Indian, and other Asian partners, an unconventional energy arms race will help change the direction of the world's energy quest. This Article proceeds in four parts. Part I of this Article explores the Pentagon's push to reduce its use of conventional fuels and increase its energy efficiency. The military's mission is driving energy innovation. This Part will examine how successful energy technologies and effective regulatory mechanisms that support clean energy innovation are shared across the globe through informal networks and formal treaty mechanisms. The defense department's move to reduce reliance on fossil fuel and towards increased efficiency has started a Green Arms Race n15 that has the power to not only create a stronger, more capable military, but also to align the efforts of academics, environmentalists, warriors, and nations to alter the future of our warming world. To be effective, this vision for a clean energy future must be shared with the fastest growing economies. Part II of this paper briefly examines Chinese history and culture. Culture, which consists of shared values, expectations, assumptions, perceptions, myths, and goals learned from previous generations and passed on to future generations, indeed matters. International relations are complex and even a basic understanding of the other side's starting point can facilitate increased cooperation and coordination. Using the Obama administration's strategic rebalance of attention to the region as a vehicle, Part III of this paper suggests the United States use its military to engage China and demonstrate the power of clean and efficient energy innovation. Collaboration between the United States and China on energy and the environment is unlikely to hit politically sensitive topics like cyberspace operations or currency manipulation and allows great potential for cooperation and transparent conversation. Managed effectively, the mutually beneficial dialogue through increased military-to-military interaction between the United States and [\*677] China can facilitate the sharing of best practices on a range of security issues like humanitarian assistance or disaster relief. This engagement will also allow military leaders from both nations to develop cultural understanding and personal relationships. These ties will not only help avoid miscalculation and misunderstanding during times of crisis, but also will have the power to bend the global outlook for energy demand. Part IV concludes by discussing the impact of sustained U.S.-China cooperation on global governance and the language of energy policy.

## Solvency

### 2nc Military Action Spills-Over

#### The US military energy developments will spill over into commercial market and spread globally

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

I. THE UNCONVENTIONAL ENERGY ARMS RACE The United States military plays in its own league. Accounting for close to forty percent of the world's total military spending, the U.S. military budget dwarfs all others. And of course, the financial ledger does not tell the whole story. China's People's Liberation Army is the largest military force in the world, with an advertised active strength of around 2.3 million personnel. n16 Even so, the ability to project power is a critical variable. In this area, the United States has the sizable advantage. The United States Navy is the premier vehicle of American force projection. The Navy sails ten nuclear powered aircraft carriers, with two more under construction. n17 They are the largest ships in the world, each designed for an approximately 50-year service life, with only one mid-life refueling. n18 As Ray Mabus, Secretary of the Navy, stated recently: [T]he Founding Fathers . . . recognized that having a Navy and Marine Corps to sail the world's oceans and protect our commerce and national interest was vital in making the United States a player on the world stage. From George Washington's first schooners . . . the Navy was seen as important, yes in wartime, but also in peacetime . . . that is called presence. Presence is what we do; presence is what the Navy and Marine Corps are all about. n19 [\*678] This global presence takes a tremendous amount of energy to fuel. The Defense Department is the single largest energy consumer in the nation, responsible for just under two percent of total consumption. n20 In 2012, the U.S. military used 4.3 billion gallons of fuel at a cost of approximately $ 20 billion. n21 Oil is a globally traded commodity. Due to spikes in the global market, in 2012 alone, the Department of Defense had $ 3 billion in unbudgeted fuel costs. n22 Energy is an essential element of the United States' global presence, and for precisely that reason, the Department of Defense is at the center of energy innovation. Military leaders, informed by the longest sustained conflict in American history, are finding that military forces are far more agile as energy efficiency increases and the tether of liquid fuel diminishes. This Defense-led energy innovation, managed effectively, can be shared through both formal treaty mechanisms and informal networks to globalize the demand for unconventional energy and drive the development of new technology and effective regulation. Our allies will be strong partners, able to localize the benefits of a more efficient and lethal military force. The global demand and innovation will spill over into the commercial market, making new technology available to private citizens across the globe. This defense-led energy innovation has the power to unite the once bespoke approaches to address climate change, energy policy, and national security. The unconventional energy arms race will result in a more efficient fighting force, more diverse sources of energy, and a more stable world order. History provides great instances of defense-driven innovation leading greater change. The next section explores just one example.

#### Empirically military action spills-over to private sector

Arey 11, Colonel Howard “Scot” Arey is an Army officer who knows that renewable energy is essential for the United States’ energy security. A graduate of West Point, East Carolina University, and the U.S. Army War College, he is preparing to settle in Central Texas after military retirement and be a part of the Texas solar industry, The Military Commitment to Renewable Energy, <http://www.txses.org/solar/content/military-commitment-renewable-energy> MWimsatt

**\*\*\*Note: this article does not list a date but references a 2011 document**

This commitment is a “two-way street” for not only can the renewable energy industry provide solutions that address the military’s requirements, but the military can provide the leadership and scale that will help this industry as much as it helped semi-conductors, the internet, and the Global Positioning System in years past. The military’s established research and development system; the scale and breadth of its requirements and operating environments; its immense purchasing power; together with a long term commitment and the trust it has with American industry and the public, means that it is a superb partner to promote and develop new energy technologies.

#### **Military action is key to solving for climate change—it serves as a model for the private sector**

Light ’14 Assistant Professor at The University of Pennsylvania (5/20/14, Sarah E., Boston College Law Review, “The Military-Environmental Complex”, <http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3389&context=bclr>)

Although the military-industrial complex has largely pejorative connotations, scholars have recognized a more positive dimension to the cooperation it engendered between the military and the private sector. 11 At its height during the twentieth century, the military-industrial complex led to the development of new technologies such as semiconductors, the global positioning system (GPS), the internet, and computers, inventions that transformed both war fighting and the civilian realm. 12 In addition to these “spin-offs” from the military into the private sector, military procurement of commercially developed technologies stimulated industrial development by “spin-ons” from the private sector to the military. 13 Like this history of technological innovation, the military’s current relationship to the environment and its interaction with the private sector—particularly in the areas of sustainable energy use, demand reduction, and pursuit of renewable energy sources— are far more complex than legal exemptions or statistics about the DoD’s greenhouse gas emissions might lead one to believe. A more nuanced understanding of the relationship between the military and the environment in this exceptional area of sustainable energy use and climate change is both warranted and timely.

The debate over how to combat climate change—focusing, for instance, on efforts to reduce energy demand and promote the development of renewable energy sources—provides an especially important context in which to assess what role the military can play in advancing solutions to a major environmental problem. The primary questions in this law and policy debate center on the types of regulatory tools that best address the problem and the level of government at which those tools are best employed. 14 There is a growing consensus among scholars that a multi-faceted approach to climate change—including efforts to reduce energy demand and switch to renewable sources of energy that incorporate both public and private action—is essential in light of the practical reality that a single, global regulatory program is unlikely to materialize. 15 This Article reinforces the notion that heterogeneity is essential, and that no single perfect solution to the climate change problem exists.

The military has the potential to make an enormous impact on climate change policy, especially in its stimulation of strategies to reduce energy demand and encourage the development of renewables. Scholars and policymakers should think carefully about how to harness the exceptional alignment between the military’s mission and its need to reduce energy demand and develop renewables, and more specifically, how cooperation between the military and the private sector could advance these ends. What this Article calls the “Military-Environmental Complex” has the potential to become one important tool in the regulatory toolkit to combat climate change. The Military-Environmental Complex also has the potential to transform some of the negatives of the historic military-industrial complex into positives for the environment and sustainability.

Properly understood, the military’s roles as a war fighter, a landlord, a firstuser of precommercial technologies, and a potential high-demand consumer provide it with the opportunity to lead the way in sustainable energy use and development of technologies. The DoD has already taken important steps to reduce energy use, especially through partnering with the private sector. With reference to the lessons of the military-industrial complex—and with controls to limit fraud, abuse, and rent-seeking behavior—these efforts should be expanded in the new Military-Environmental Complex.

#### Innovations by the military are adopted commercially—empirics prove

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

As the Navy demonstrates and validates advanced biofuels, prices will fall and other industries will begin to incorporate proven technologies into their operations. Commercial airlines have completed test flights using biofuels and "[o]ther nations pursuing advanced biofuels like Brazil, Australia, and Singapore create the potential for increased cooperation on research, development, deployment, and increased security for our allies." n83 Energy innovation has made the Navy more capable and better able to defend the United States around the globe. As with Churchill, these changes will require and encourage changes on shore. Navy and Marine Corps bases are also benefitting from the incorporation of efficiency standards, smart grids, and other energy efficient upgrades. n84

#### Military technology spills over to the private sector

Perani ’97 Researcher at the Italian National Institute of Statistics (July 1997, Guilano, Nato Research Fellowship, “Military technologies and commercial applications: Public policies in NATO countries”, <http://www.nato.int/acad/fellow/95-97/perani.pdf>)

During the ‘50s, both public opinion and policy makers in Western countries (but mainly in the United States) were impressed by the massive impact on everyday life of civilian applications of military technologies, developed during the last years of the World War II. In this context, the relations between civilian and military technologies were considered as totally influenced by the so called "spin-off effect", that is to say a sort of "mechanical" spill over of knowledge from the more advanced military field to the intrinsically less advanced commercial fields. The spin-off effect could be observed within an institutional framework in which:

- military expenditures (mainly military R&D expenditures) were allocated exclusively according to the priorities of the national security;

- military R&D activities (and military production, as well) were totally separated from commercial R&D activities;

- military needs prevailed on commercial needs in the allocation of limited resources(funds, knowledge, people, etc.) within the national economy

We can observe that the spin-off effect worked effectively in some industrial countries- such as the UK, the US and the USSR - in the final period of the World War II and in the ‘50s.We have also to point out that in the following years a “spin-off ideology” has been defined in order to justify, also in terms of technology policy, the huge spending in military R&D of NATO and Eastern countries during the Cold War period.

To overcome this conceptual problem, the Office of Technology Assessment of the US Congress, bu’’t also scholars like Jacques Gansler, have developed in the ‘80s an innovative concept in the military field: the civil-military integration (CMI). The CMI approach suggests that technological and industrial policies should be mainly aimed at integrating military and commercial activities within a unified technological and industrial base.

In seeking benefits from the collaboration with the commercial industry it is obvious for the DoD to place high priority in ensuring that the “commercial technology base remains at the leading edge in areas critical to the US military” 20. As a consequence, the DoD will invest in those technologies that appear to have dual-use characteristics and match military requirements, and that would not be developed by private investments alone21

.Investments in dual-use S&T have represented almost 25% of the all S&T programme in 1995. An important share of it went to project directed by the ARPA like those on information technology, materials technology, electronics and advanced simulation and modelling. These and other projects are clearly directed toward the development of technologies than can be used both for military or commercial goods (see box ). In seeking benefits from the collaboration with the commercial industry it is obvious for the DoD to place high priority in ensuring that the “commercial technology base remains at the leading edge in areas critical to the US military” 20. As a consequence, the DoD will invest in those technologies that appear to have dual-use characteristics and match military requirements, and that would not be developed by private investments alone21. At the beginning of the 1990s, the US economy was performing worse than the economies of other Western countries. In order to favour an economic recovery, the federal budget deficit had to be reduced drastically also reducing military spending, but it was also necessary to improve the technological competitiveness of US firms in international markets. The dual-use strategy was, therefore, conceived to be something more than just a reform in the DoD acquisition system, entailing significant consequences for the whole US defence industrial system, as well as for the US economy.

#### The private sector takes technology after the military does—solar proves

Scott and Narayanan ’12 (7/18/12, Gordon and Anusha, Sierra Club, “US MILITARY LEADS THE WAY IN DEVELOPING AND IMPLEMENTING MOBILE CLEAN ENERGY TECHNOLOGY” http://sierraclub.typepad.com/compass/2012/07/military-clean-energy.html#more)

Over the course of the past half-century, the U.S. military has proven prescient when it comes to developing and implementing new technology. From satellites to microwave technology to the internet to cellular phones, the military has taken the lead on nearly every significant technological advance that has later swept the private and consumer markets.

Now, the military is getting a leg-up on another technology that is poised to lead the next major private-sector revolution – not weapons or communications, but large-scale mobile solar-powered energy systems.

Through a contract with [SunDial Capital Partners](http://www.sundialcapitalpartners.com/), the Department of Defense has been implementing a new interface for mobile solar technology. Founded in 2009, SunDial pioneered a system custom-made for on-the-move military operations, harnessing renewable solar energy into a highly mobile unit.  With deep military roots, SunDial President Dan Rice, Vice President Keegan Cotton, and Partner Lee Van Arsdale – all three West Point graduates and combat veterans – recognized a unique market for mobile power supply. As [energy prices from traditional fuels rise](http://www.bloomberg.com/news/2012-06-19/cheap-coal-is-dead-long-live-renewables-part-1-.html) and the military’s dependence on energy continually grows, SunDial envisioned a new application for existing solar technologies for remote locations.

The Department of Defense and U.S. Special Operations Forces saw strong potential in SunDial’s system, and purchased the company’s first operational models. In 2010, Special Operations Forces began the Mobile Solar Power Initiative, testing the SunDial system at the Aberdeen Proving Grounds in Maryland, and later successfully testing models in the field in Afghanistan.

Testifying before the U.S. Congress about the mobile solar initiative, Admiral Eric Olson, then-Commander of Special Operations Command, said the Special Operations Forces community, “inherently joint in all it does, is in a unique position to leverage and apply Service and Department Science and Technology efforts to rapidly field new technologies on the battlefield.” Often located in the most remote areas where fuel must be airlifted to the point of consumption, Special Operations Forces had the greatest need for renewable energy solutions.

SunDial’s unique system has a clear attraction for military operations. Packed into a single 20-foot shipping container for easy transport, the unit consists of 120 installation-ready solar photovoltaic panels combined with a convenient communications center. A team of one trained expert and five or six local laborers can unpack the container and set up a functioning solar field within two hours.

Once emptied, the trailer is equipped to double as a self-sufficient field operations facility. The whole unit can be packed up again on a moment’s notice, and transported to the next location, or can be transferred to the local population as part of the exit strategy to power the village long term with sustainable energy – an innovative application in “nation building” at the village level that is very attractive to special forces.

When fully set-up and functioning, a single unit can produce 28.8 kilowatts (kW) of power at peak daylight hours (which will increase to 34.2 kW with capacity and design improvements already in development) – significantly more than other comparable mobile solar energy systems. While the sun is shining, the panels produce “load” power and also charge a system of 64 storage batteries housed within the floor of the trailer unit. After dark, the batteries provide power well into the night, with an optional back-up diesel generator that kicks in automatically when the batteries become depleted to provide seamless power. At sun-up, the diesel generator turns off and the solar panels take over again, producing power and recharging the batteries.

“We see mobile solar/battery/diesel hybrid systems as a game-changer globally,” said Dan Rice, President of SunDial. “Oil companies, mining companies, non-profits, disaster-relief agencies, foreign militaries, and anyone operating off-grid can see cost savings and value in converting from diesel only. This is where renewable energy makes the most sense – in remote areas where the current cost of energy is the highest because fuel to remote areas is expensive and logistically challenging.”

Though the military has been at the forefront of recognizing global climate change as a [significant national security risk](http://www.cna.org/sites/default/files/news/FlipBooks/Climate%20Change%20web/flipviewerxpress.html) and taking steps to reduce its carbon footprint, that is not the driving motivation behind these clean-energy innovations. From the military’s standpoint, the main advantage of mobile renewable-energy systems is tactical – energy self-sufficiency improves the effectiveness and mission-readiness of our troops, and makes them safer. For one thing, it reduces dependency on foreign oil which is made into JP-8 (military fuel) and transported across the globe.

Second, it cuts down on the need for costly and dangerous fuel-resupply convoys, allowing operations to reach remote areas previously unsuitable for advanced equipment due to the difficulty of resupplying diesel fuel. This also acts as a ‘force-multiplier,’ freeing up personnel for other tasks and increasing the effectiveness of a set number of troops. SunDial’s Maryland-built systems therefore reduce convoys, save lives and taxpayer dollars, and create jobs in the United States.  “It’s a win, win, win, win,” says Rice, who speaks from experience: he was awarded the Purple Heart after being hit by an Improvised Explosive Device in Iraq in 2005.

While the international community, national governments, and the private sector have largely lagged behind in recognizing the benefits of and mobilizing funding for clean energy technology, the military is establishing a [strong track record for funding and developing such systems](http://www.army.mil/article/81886/Service_Officials_Affirm_Commitment_to_Renewable_Energy/). In addition to SunDial’s mobile-solar units for operations overseas, the DoD is investing in major [clean-energy installations](http://www.forbes.com/sites/amywestervelt/2012/02/06/why-the-military-hates-fossil-fuels-part-two-alternatives/) on domestic bases.  A Navy SEAL program is testing [individualized solar-powered gear](http://www.scientificamerican.com/article.cfm?id=us-military-forges-ahead-with-plans-to-combat-climate-change) for troops on the move in an effort to make soldiers net-zero energy and net-zero water use.

If recent history serves as an example, now that the military has invested the up-front R&D funding to carry these nascent technologies through the testing phase and proven their viability, the previously-skeptical private sector will jump on board, finding new civilian applications and making them widely available to a broader market. Once the private sector recognizes that there are similar efficiency and sustainability gains to be made in the civilian arena, SunDial and other solar-energy innovators will be well-positioned to cash in.

In fact, SunDial is already expanding its scope beyond purely military applications. Through contracts with foreign governments and private energy companies, SunDial now has mobile solar units operating in multiple countries on three continents (North America, Asia, and Africa). These units are bringing power to remote locations which have never before been electrified – such as one unit funded by a Chevron project that is powering a new water purification facility in rural Nigeria – replacing extremely dirty diesel generators and providing energy at a fraction of the cost. The emptied containers then become fully-powered, usable space that can serve as telemedicine clinics, internet cafes, corporate headquarters, or even living quarters to house personnel.

Looking ahead, SunDial sees a strong market for its mobile solar units in the contexts of disaster relief, rural electrification, and humanitarian assistance.

#### The DOD has a strong motive to solve—it spills over to the private sector

DOD ’10 (February 2010, Department of Defense, “Quadrennial Defense Review Report”, http://www.defense.gov/qdr/images/QDR\_as\_of\_12Feb10\_1000.pdf )

Climate change and energy are two key issues that will play a significant role in shaping the future security environment. Although they produce distinct types of challenges, climate change, energy security, and economic stability are inextricably linked. The actions that the Department takes now can prepare us to respond effectively to these challenges in the near term and in the future.

Climate change will affect DoD in two broad ways. First, climate change will shape the operating environment, roles, and missions that we undertake. The U.S. Global Change Research Program, composed of 13 federal agencies, reported in 2009 that climate-related changes are already being observed in every region of the world, including the United States and its coastal waters. Among these physical changes are increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the oceans and on lakes and rivers, earlier snowmelt, and alterations in river flows.

Second, DoD will need to adjust to the impacts of climate change on our facilities and military capabilities. The Department already provides environmental stewardship at hundreds of DoD installations throughout the United States and around the world, working diligently to meet resource efficiency and sustainability goals as set by relevant laws and executive orders. Although the United States has significant capacity to adapt to climate change, it will pose challenges for civil society and DoD alike, particularly in light of the nation’s extensive coastal infrastructure. In 2008, the National Intelligence Council judged that more than 30 U.S. military installations were already facing elevated levels of risk from rising sea levels. DoD’s operational readiness hinges on continued access to land, air, and sea training and test space. Consequently, the Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required

The Department is increasing its use of renewable energy supplies and reducing energy demand to improve operational effectiveness, reduce greenhouse gas emissions in support of U.S. climate change initiatives, and protect the Department from energy price fluctuations. The Military Departments have invested in noncarbon power sources such as solar, wind, geothermal, and biomass energy at domestic installations and in vehicles powered by alternative fuels, including hybrid power, electricity, hydrogen, and compressed national gas. Solving military challenges-through such innovations as more efficient generators, better batteries, lighter materials, and tactically deployed energy sources—has the potential to yield spin-off technologies that benefit the civilian community as well. DoD will partner with academia, other U.S. agencies, and international partners to research, develop, test, and evaluate new sustainable energy technologies.

Indeed, the following examples demonstrate the broad range of Service energy innovations. By 2016, the Air Force will be postured to cost-competitively acquire 50 percent of its domestic aviation fuel via an alternative fuel blend that is greener than conventional petroleum fuel. Further, Air Force testing and standard-setting in this arena paves the way for the much larger commercial aviation sector to follow. The Army is in the midst of a significant transformation of its fleet of 70,000 non-tactical vehicles (NTVs), including the current deployment of more than 500 hybrids and the acquisition of 4,000 low-speed electric vehicles at domestic installations to help cut fossil fuel usage. The Army is also exploring ways to exploit the opportunities for renewable power generation to support operational needs: for instance, the Rucksack Enhanced Portable Power System (REPPS). The Navy commissioned the USS Makin Island, its first electric-drive surface combatant, and tested an F/A-18 engine on camelina-based biofuel in 2009—two key steps toward the vision of deploying a “green” carrier strike group using biofuel and nuclear power by 2016. The Marine Corps has created an Expeditionary Energy Office to address operational energy risk, and its Energy Assessment Team has identified ways to achieve efficiencies in today’s highly energy-intensive operations in Afghanistan and Iraq in order to reduce logistics and related force protection requirements.

#### Military research spills over to the private sector

Chiang ’91 Professor at the National University of Taiwan (June 1991, Jong-Tsong, Technology Forecasting and Social Change, <http://dspace.mit.edu/bitstream/handle/1721.1/49318/technologicalspix00chia.pdf?sequence=1>, Vol40, no.4, Massachusetts Institute of Technology)

During the three decades following World War II, the U.S. spin-off achievements of a number of mission-oriented programs were high-performance fighters and bombers), computers (for plotting missile trajectories). semiconductors (for missile guidance systems), numerical control (for carving out aircraft structural parts), nuclear energy (for naval nuclear propulsion), lasers (for tank range finders and beam weapons). and time sharing, digital communications and computer graphics (for air defense system).

It is apparent that the impacts of some U.S. spin-off cases are very far-reaching. Semiconductors (i.e., transistors and integrated circuits) and (electronic) computers together illustrate this very well. They have triggered "technological paradigm" change. Revolutionary miniaturization, data processing, digital communications, etc. are all with the new information technology (IT) paradigm." They have also brought about new "technology systems." "Mechatronics," computer-based automation, and the integration of computing and communications are obvious examples. What is more, they have even caused "techno-economic paradigm" shift, and laid the foundation for a modern “information society.”14

By any measure, the U.S. spin-off achievements in the post-war era were unmatched by any other country. However, it is really difficult to measure the spin-off impacts, even only in rough economic terms. Generally speaking, military (and aerospace) R&D may reduce the cost or increase the capability for performing civilian R&D by sharing very expensive equipment (e.g., large wind tunnels or supercomputers) with civilian research projects, by introducing highly sophisticated instrumentation to civilian research laboratories, or by transferring military R&D experience to civilian research arena. But the magnitude of influence is not easy to determine. Additionally, many issues involved are also concerned with the fundamental difficulties in assessing technological innovation. For example, let alone the indirect and long-term contribution, it may be relatively easy to calculate the cost saving or price increase resulting from process innovations, but it is usually hard to assess product innovations, some of which may be so novel or so radical as to create new lines of business or even new industries. In this respect, U.S. modern military R&D primarily puts much more emphasis on performance than on costs. So it tends to contribute more to product innovation than to process innovation, and indeed it did have created many new frontiers and new industries. This adds to the difficulty of measuring the benefits of spin-off.

If the opportunity cost is taken into account, the complexity of evaluation becomes even more insurmountable. Except that there are resources remaining idle and rather readily available, the possibility of diversion or "draining" of limited resources exists. For example, the defense technology programs could be compared with R&D sponsored by NSF, by other Federal agencies, or by commercial companies. They could also be assessed against a system differently managed. And there could even be investments of different weights along the spectrum of basic research, applied research, development, engineering, testing and validation. In fact, many standards and criteria could be used.15 Though without accurate measurement, in the U.S., given the very large share of national R&D resources consumed by military R&D, the opportunity cost must be very high. Certainly it could be argued that the consideration of spin-off cost is inappropriate because the cost should be charged against the targeted missions. But when spin-off is advocated as one reason to justify part of the investment or as an implicit strategy to bolster civilian technology which has to emphasize cost effectiveness, the concern about cost makes some sense.

The first spin-off mechanism concerning technology generation is the mission agencies' substantial R&D contracts, subsidies and collaboration in the critical technological areas of potentially commercial relevance, without which, civilian industry may under-invest because of the perceived unaffordably high risks or costs. The birth of electronic computers and nuclear power, and the first successful commercial jet aircraft as well as the big progress in jet engines have directly benefited from this mechanism. In contrast, though DOD and NASA supported relevant semiconductor research, the most radical technological progress, i.e., transistors in Bell Laboratories and integrated circuits (ICs) in Texas Instruments and Fairchild, did not take place under their direct sponsorship of R&D.

### 2nc Military Info Shared with Public / Other Agencies

#### Naval Research Laboratory shares exploration research and data with civilian agencies

Defense Systems Staff ’14 (3/5/14, Defense Systems --- Defense systems is a publication designed to provide information to the defense IT community, “Navy opens its Global Ocean Forecast System to the public”, <http://defensesystems.com/articles/2014/03/05/navy-noaa-global-ocean-forecasting.aspx>)

The Navy’s detailed global environmental ocean forecasting will soon be available to the public via the National Oceanic and Atmospheric Administration.

The Naval Research Laboratory has agreed with NOAA’s National Centers for Environmental Prediction to let NCEP use the Global Ocean Forecast System, which combines satellite and in situ monitoring with meteorology, oceanography and geospatial services in making forecasts.

"Development of an advanced global ocean prediction system has been a long-term Navy interest," Dr. Gregg Jacobs, head of NRL’s Ocean Dynamics and Prediction Branch, said in an [announcement](http://www.nrl.navy.mil/media/news-releases/2014/navy-transitions-global-ocean-forecast-system-for-public-use). "This use of Navy-developed systems for global ocean forecasting represents dual-use technology that will benefit civilian interests and is an excellent example of the cutting edge research that is enabled through Navy-sponsored investments."

The system was developed by a collaboration of the Office of Naval Research, NRL research and development, and the Oceanographer of the Navy. It has three main components, Jacobs said:

Satellite observations that precisely measure sea surface height and temperature and ice concentration, combined with in situ observations from public sources and Navy ships.

Numerical models of ocean physics and numerical methods of representing those physics.

Technology that can correct the numerical models through data assimilation.

The Navy uses the system for tasks ranging from search and rescue and tracking mines to placing sonar arrays and estimating acoustic propagation.

NCEP already provides a variety of [forecasting services](http://www.ncep.noaa.gov/), including those for storms, aviation conditions and ocean conditions, using data from satellites and such sources as NOAA buoys around the U.S. coast. Using the Navy’s system will give it a more dynamic model for making ocean forecasts.

#### Navy Created GIS mapping system which can be shared with the public

Geospatial World, 13 (2/1/2013, “‘US Navy should develop public GIS map of the oceans’” http://www.geospatialworld.net/News/View.aspx?ID=26301\_Article)

US: The US Navy can offer a Google-type information service to the world by organising its diverse data in a form that would serve individuals, businesses and people. This would place the Navy in the realm of GIS providers whose services are sweeping the globe, said John Smart, president of the Acceleration Studies Foundation.¶ Speaking at the AFCEA/USNI West 2013 in San Diego, Smart suggested that the Navy could become an agent of change by organising data collected by its numerous sensor systems and making it available to the public at large.¶ The service would be built around the concept of open, safe, lawful and sustainable seas for all people, Smart said. The Navy would create a public GIS map of the oceans and populate it with vital information—all unclassified—that would be useful for anyone entering the maritime environment.¶ This product would comprise grid maps bearing information fed by Navy-run sensors. It would be improved as new means of collecting data generated more expansive information. The Navy would design the information architecture for the system and maintain it as a global public service. - See more at: http://www.geospatialworld.net/News/View.aspx?ID=26301\_Article#sthash.yOUHvd8A.dpuf

#### Naval Research Lab forecasting model adopted by NOAA

Hoffman, 14 (3/5/2014, Mary-Louise, “Gregg Jacobs: Naval Research Lab Builds Ocean Weather Monitoring Tech for NOAA,” http://www.executivegov.com/2014/03/gregg-jacobs-naval-research-lab-builds-ocean-weather-monitoring-tech-for-noaa/)

The National Ocean and Atmospheric Administration will adopt a weather forecasting model developed by the Naval Research Laboratory to deliver sea-based environmental data for public use.¶ ¶ NRL built the Hybrid Coordinate Ocean Model system to provide seven-day forecasts everyday throughout the year as part of a national oceanographic partnership initiative, NRL said Wednesday.¶ ¶ “Development of an advanced global ocean prediction system has been a long-term Navy interest,” said Gregg Jacobs, head of NRL’s ocean dynamics and prediction branch.¶ ¶ “This use of Navy developed systems for global ocean forecasting represents dual use technology that will benefit civilian interests and is an excellent example of the cutting edge research that is enabled through Navy sponsored investments,” Jacobs added.¶ ¶ NOAA’s National Center for Environmental Prediction will implement the NRL-made platform to help civilian organizations manage at-sea operations, avoid hazards and respond to emergencies, NRL says.¶ ¶ The center also works to provide satellite-based observations around U.S. coasts to the public, according to the lab.

### 2nc AT: Public-Private Partnership Key

#### The military can do public-private partnerships

Arey 11, Colonel Howard “Scot” Arey is an Army officer who knows that renewable energy is essential for the United States’ energy security. A graduate of West Point, East Carolina University, and the U.S. Army War College, he is preparing to settle in Central Texas after military retirement and be a part of the Texas solar industry, The Military Commitment to Renewable Energy, <http://www.txses.org/solar/content/military-commitment-renewable-energy> MWimsatt

**\*\*\*Note: this article does not list a date but references a 2011 document**

In the next article, we’ll look at two installations in Texas that are establishing industry partnerships and innovation. Fort Bliss in El Paso is one of the Army’s “Net Zero” posts with a goal of net zero status in energy, water, and waste by 2020 (not a typo…that’s eight years from now!) With over $1.5 billion of investment potential in less than a decade, that’s a real commitment which Texas renewable industries must compete for. Dyess Air Force Base in Abilene has already been commended for getting 100% of its electricity from renewable wind generation. It is continuing to secure its energy future with additional net zero initiatives that will be sure to solidify its position as one of the Air Force’s “greenest” bases. These are just two of many renewable initiatives that are happening in Texas, but there is more - renovating barracks and associated inefficient energy plants at Fort Hood, building LEED-rated hospitals in San Antonio, installing solar power on National Guard buildings in Austin - the list goes on and on. The future isn’t tomorrow, it’s happening right now in the U.S. military.

### Renewable Energy Solvency

#### The military can invest in all kinds of renewables

Arey 11, Colonel Howard “Scot” Arey is an Army officer who knows that renewable energy is essential for the United States’ energy security. A graduate of West Point, East Carolina University, and the U.S. Army War College, he is preparing to settle in Central Texas after military retirement and be a part of the Texas solar industry, The Military Commitment to Renewable Energy, <http://www.txses.org/solar/content/military-commitment-renewable-energy> MWimsatt

**\*\*\*Note: this article does not list a date but references a 2011 document**

A Pew Charitable Trust report, “From Barracks to the Battlefield: Clean Energy Innovation and America’s Armed Forces” shows the different lines of effort. From new vehicle technologies that reduce fuel requirements, to use of biofuels in aircraft and ships (The “Great Green Fleet” armada experiment is ongoing), to energy efficiency, smart grids, and renewable energy at its installations, the military quest for energy security is sweeping. What should be important to Texas is that each of these efforts is happening today within it’s borders! Tanks, C-17 heavy-lift cargo aircraft, and ships operate here. Our mega-size installations are looking to implement smart-grids and local renewable energy generation to ensure 100% secure, reliable electricity. As dependable electricity supply becomes more questionable, it is no wonder that the military recognizes that its dependence on civilian electricity generation is vulnerable.

#### The Navy can lead the way in developing renewable ocean energy, already discussions on offshore wind, otec, wave, and tidal energies

Waller 12 (4/2/12, Darrell Waller, Naval Facilities Engineering Command Public Affairs, America’s Navy, “Navy Seeks Renewable Ocean Energy Technology at Industry Forum” <http://www.navy.mil/submit/display.asp?story_id=66173>)

KANEOHE BAY, Hawaii (NNS) -- The Navy's energy future was the focus of a two-day NAVFAC Conference and Industry Day held March 26-28 at the Koa Malina Officers Club, Marine Corps Base Hawaii (MCBH), Kaneohe Bay. The Navy, in partnership with the U.S. Department of Energy, will select three ocean energy power developers to occupy Wave Energy Test Site (WETS) moorings at Kaneohe Bay. "The Navy is committed to reducing our dependence on fossil fuels and is leading the way on the development of viable, renewable energy sources," said NAVFAC Pacific Vice Commander Capt. Pete Lynch. "NAVFAC Pacific is working on ways to make the Navy's shore infrastructure more energy independent and strengthen our energy security position. The ocean is an untapped resource and possible source of renewable energy. The conferences we are hosting will help us learn the new ocean energy technology and systems that exist today." Presentations were received from more than forty energy companies worldwide, and renewable ocean energy information was shared between private industry and Navy engineers. The conference and industry day was intended to spotlight the latest in ocean energy technical development and, in partnership with private industry, utilize innovative technologies to achieve the Navy's energy goals. Knowledge sharing was mutually beneficial to all participants."We learned so much during today's presentations, especially in the one-on-one meetings with industry," said Bob Fredrickson NAVFAC Engineering Service Center (NAVFAC ESC) division director, Ocean Facilities Department. "Many of the companies had technologically advanced ideas, some of which looked very promising. We also spoke with developers who are relatively new to the field, and we realize they still need to advance their research and development efforts before they are ready to become contenders for testing at WETS. Nevertheless, all input was welcomed since we are hoping to add an ocean renewables component to the Navy and Marine Corps overall energy mix."

#### The military is pursuing small scale renewable energy

Anderson ’14 master’s degree in international relations with a focus on energy from New York University (1/23/14, Jared, “US Military Working with Private Sector to Strengthen Domestic Installation Energy Security” http://breakingenergy.com/2014/01/23/us-military-working-with-private-sector-to-strengthen-domestic-installation-energy-security/)

Domestic military installations require reliable energy sources that can power their operations 24-hours per day under all circumstances. Mission assurance, cost savings and mandated energy saving initiatives are driving the Department of Defense to deploy new energy technology with the help of innovative financing mechanisms.

The three main military branches each have a goal of deploying 1 GW of renewable energy by 2025 and they are using different strategies in different regions. “The branches have organized differently, but they are all trying reach same goal of 3 GW by 2025,” Phyllis Cuttino, Clean Energy Program Director at the PEW Charitable Trusts recently told Breaking Energy.

PEW and consulting firm Navigant Research released a report last week entitled Power Surge: How the Department of Defense Leverages Private Resources to Enhance Energy Security and Save Money on U.S. Military Bases.

“This research focuses on the energy security challenges at domestic defense installations, where 20 percent of the Department of Defense’s power consumption occurs. Recent history has underscored the continuing role that soldiers and civilians on domestic bases provide, whether it is in supporting troops operating thousands of miles away or here at home assisting emergency response and relief operations for American communities suffering from natural disasters. None of this can happen unless our military installations have a diversity of efficient power sources they need every minute of every day of the year,” Senator John W. Warner, Retired, says in the report.

The analysts find by 2018 the US military should have 2.1 GW deployed at domestic installations. “Bases have traditionally been dependent on the commercial grid and last year there were 87 outages of 8 hours or more on bases. They must have 24/7 power for mission assurance,” said Cuttino.

In a tight budgetary environment, any time you can use money more effectively you do it and they are mandated to do it by congressional and executive branch directives, Cuttino explained.

Private Sector Playing an Operational and Financial Role

“The military is not really interested in going into the energy business, so they are striking partnerships with companies like Sun Edison and Honeywell that will put in equipment and handle up-front costs. They are working with the private sector to achieve their goals,” Cuttino said.

In many cases the military has land they can’t use because the base only takes up a portion of the total parcel owned, so they are bringing in companies to develop solar arrays, for example, that guarantee a return on investment through financing mechanisms like enhanced use leases, power purchase agreements and a variety of other arrangements.

“It’s a win-win,” said Cuttino. “The base gets the energy they need and the company can sell any excess power to the grid.”

“The value of energy saving performance contracts across the armed forces has increased from $277 million in fiscal 2010 to just over $411 million in fiscal 2012, a 49 percent increase. Use of utility energy service contracts totaled $47.2 million in fiscal 2012, a 3 percent increase over fiscal 2010. Overall, the value of DOD third-party energy-efficiency contracts has increased by 42 percent, from $323 million in 2010 to $459 million in 2012,” according to the report.

The military is currently home to 50% of all microgrid projects in the US.

“The DOD is leading the way with emerging energy technology, as they have in the past with other technologies,” said Cuttino.

“The military is a great partner because they use lots of energy, have money and are reliable.”

#### The military can lead a transition to alternative fuel—empirics prove

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

A. Historical Perspective--Global Presence Fueling Innovation Throughout history, great navies have been at the center of energy innovation. n23 Commanders seeking even incremental advantages on the seas [\*679] led the transitions from oar power to canvas sails, from sails to coal, from coal to oil, and from oil to nuclear power. n24 In the 1850s, it was the United States Navy that led the transition from wind power to coal. After World War II, Navy Admiral Hyman Rickover and his team, in just seven years, developed the technology, engineered, and built the first nuclear submarine, the USS Nautilus. n25 Today, the U.S. Navy is again at the forefront of energy innovation, sailing the Great Green Fleet, a carrier strike group fueled by alternative sources of energy, including nuclear power and advanced biofuel blends. The Great Green Fleet demonstrated its technology during the 2012 Rim of the Pacific exercise, the world's largest international maritime exercise. The Navy's quest for greater operational flexibility is lessening its reliance on petroleum and changing the way we think about energy. As we wade into the second decade of the 21st century, the United States Navy finds itself on a path blazed one hundred years ago by a daring First Lord of the Admiralty.

#### Military has strong incentive for renewable energies

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

Both in the operational environment and on board military installations, energy innovation has saved lives and reduced costs. In addition to the roughly $ 15 billion spent on fuel, between fiscal years 2003 and 2007, in Iraq and Afghanistan, more than 3,000 Army personnel and contractors were wounded or killed in action from attacks on fuel and water resupply convoys. n67 Further, every dollar per barrel increase in the price of oil requires a $ 30 million increase in the Department of the Navy's fuel budget n68 and a $ 130 million addition to the overall Department of Defense budget. n69 Programs like the Navy's Great Green Fleet and the Marine Corps' Experimental Forward Operating Base ("ExFOB") are driving innovation and making the Navy and Marine Corps team more mission capable.

### Renewable Fuels

#### Military techniques allow for conversion of seawater to oil

Harres’14 (4/8/14 International business Times, “Goodbye, Oil: US Navy Cracks New Renewable Energy Technology To Turn Seawater Into Fuel, Allowing Ships To Stay At Sea Longer” http://www.ibtimes.com/goodbye-oil-us-navy-cracks-new-renewable-energy-technology-turn-seawater-fuel-allowing-1568455)

After decades of experiments, U.S. Navy scientists believe they may have solved one of the world’s great challenges: how to turn seawater into fuel. The development of a liquid hydrocarbon fuel could one day relieve the military’s dependence on oil-based fuels and is being heralded as a “game changer” because it could allow military ships to develop their own fuel and stay operational 100 percent of the time, rather than having to refuel at sea. The new fuel is initially expected to cost around $3 to $6 per gallon, according to the U.S. Naval Research Laboratory, which has already flown a model aircraft on it. The Navy’s 289 vessels all rely on oil-based fuel, with the exception of some aircraft carriers and 72 submarines that rely on nuclear propulsion. Moving away from that reliance would free the military from fuel shortages and fluctuations in price. "It's a huge milestone for us," said Vice Adm. Philip Cullom. "We are in very challenging times where we really do have to think in pretty innovative ways to look at how we create energy, how we value energy and how we consume it. We need to challenge the results of the assumptions that are the result of the last six decades of constant access to cheap, unlimited amounts of fuel." The breakthrough came after scientists developed a way to extract carbon dioxide and hydrogen gas from seawater. The gasses are then turned into a fuel by a gas-to-liquids process with the help of catalytic converters. "For us in the military, in the Navy, we have some pretty unusual and different kinds of challenges," said Cullom. "We don't necessarily go to a gas station to get our fuel. Our gas station comes to us in terms of an oiler, a replenishment ship. Developing a game-changing technology like this, seawater to fuel, really is something that reinvents a lot of the way we can do business when you think about logistics, readiness." The next challenge for the Navy is to produce the fuel in industrial quantities. It will also partner with universities to maximize the amount of CO2 and carbon they can recapture. ”For the first time we've been able to develop a technology to get CO2 and hydrogen from seawater simultaneously. That's a big breakthrough," said Dr. Heather Willauer, a research chemist who has spent nearly a decade on the project, adding that the fuel "doesn't look or smell very different." “We've demonstrated the feasibility, we want to improve the process efficiency," explained Willauer.

#### Navy developing renewable fuels

Subramanian 14 (April 22, 2014, Courtney Subramanian, Nation Swell, “The U.S. Navy May Have Found A Game Changer in Renewable Energy”, <http://nationswell.com/u-s-navy-may-found-game-changer-renewable-energy/#ixzz35ghnYcyE>)

The U.S. Navy is known to call itself “a global force for good,” and thanks to a recent renewable energy breakthrough, it may be living up to its reputation. Last week researchers at the U.S. Naval Research Laboratory’s (NRL) Materials Science and Technology Division announced the successful flight of a small model airplane powered by a liquid hydrocarbon taken from seawater. Yes, that’s right. The ocean. While it may just sound like a group of scientists flying a toy plane, the development could mean a future powered by one of the world’s largest infinite natural resources (here comes the oil industry hand-wringing). The process, which extracts carbon dioxide and hydrogen from ocean water and recombines it into hydrocarbon chains, may advance efforts to refuel aircraft carriers and vessels while out at sea. The Navy currently relies on 15 oil tankers to deliver almost 600 million gallons of fuel to vessels at sea per year, according to the BBC. Though it takes an exhaustive 23,000 gallons of ocean water to create just one gallon of fuel, vessels equipped with nuclear reactors onboard can process the very water they float on to refuel, without having to wait for an oil tanker to help out. Researchers anticipate the new process will be ready in the next seven to 10 years, with the goal of dramatically reducing the $4 to $5 billion the military spends annually on 1.3 billion gallons of fuel. The potential green fuel would cost an estimated $3 to $6 per gallon—an expensive undertaking—but within target of the rising costs of gas. In 2012 the Navy paid about $3.60 a gallon. Currently the Navy’s 289 vessels rely on oil-powered fuel but approximately 72 submarines and some select aircraft carriers are powered by nuclear energy. So should we expect to run our cars on saltwater anytime soon? Not so much. The Navy hopes to partner with universities for further research and plans to scale up the system onto land-based stations before shipping off a ocean-powered ship. Regardless, the new development means that reliance on oil could be a thing of the past in the not-so-distant future and yes, some day you could be pumping the Atlantic and Pacific over regular and premium at the corner station.

### Biomass Solvency

#### Military can do biomass

Crowe 10, Robert Crowe is a technical writer and reporter based in San Antonio, Texas. He has written for Bloomberg, the Houston Chronicle, Boston Herald, StreetAuthority.com, San Antonio Express-News, Dallas Business Journal, and other publications. He covers renewable energy and sustainability for various publications. As a consultant, he works closely with companies to develop technical materials for renewable energy and sustainability strategies, The US Military's Two-pronged Renewable Energy Initiative, <http://www.renewableenergyworld.com/rea/news/article/2010/09/the-us-militarys-two-pronged-renewable-energy-initiative> MWimsatt

The Air Force is also developing the largest biomass power plants in the nation. Two wood waste plants with capacities of 15 MW to 25 MW are planned for Florida’s Eglin Air Force Base and Georgia’s Robins Air Force Base, respectively. The Florida project will incorporate sustainable forestry practices. Gray expects those projects to start in 2013 and 2014.

### Wave Power Solvency

#### Navy can make wave power -- technology and large investments prove

**Casey 12** (June 24th, 2012 by Tina Casey specializes in military and corporate sustainability, advanced technology, emerging materials, biofuels, and water and wastewater issues. “Utility-Scale Wave Power, Thanks to U.S. Navy” http://cleantechnica.com/2012/06/24/navy-helps-develop-wave-power/)

**Ocean waves could soon be powering thousands of homes** and businesses in the Reedsport, Oregon area, and a good part of the credit will be **due to the U.S.** Navy. The Ocean Power Technologies technology, called PowerBuoy®, underwent two years of development at the Navy’s wave power test facility in Hawaii, and this is just the beginning. The Navy recently announced that it will be upgrading and expanding the site to provide more opportunities for innovators to test commercial-scale wave power devices.

Power from Waves

Ocean Power calls its utility-scale version of the PowerBuoy the PB150. As the buoy bobs up and down on offshore waves, it produces a mechanical stroking motion. That movement is transferred to a “power take-off” unit that drives an on-board generator. The resulting electrical power gets transmitted to shore by cable.

In this latest step along the way to deployment, **Ocean Power has completed factory testing** off the take-off unit, **and it is being installed** into the buoy.

The take-off unit represents a step up from the company’s initial efforts. It is scaled up from earlier versions, and **its direct drive system has greater efficiency compared to a hydraulic drive that was used in the first PowerBuoy designs.**

Thanks for the Wave Power, U.S. Navy

When Ocean Power began testing the PowerBuoy a couple of years ago, the device served as the country’s first grid-connected wave energy system. It provided electricity to Marine Corps Base Hawaii in Oahu.

**The Navy’s wave power test site**, at Kaneohe Bay, actually dates back to the Bush Administration as part of the Navy’s long term partnership with the University of Hawaii’s National Marine Renewable Energy Center.

The new test site upgrade **will enable wave power companies to test larger buoys, which can be positioned at greater depths.**

**It’s also worth noting that DARPA, the Pentagon’s cutting-edge research agency, has been funding research into wave power**, though its main focus is on small-scale devices that would be used to provide power for surveillance buoys and other remote devices.

### OTEC Solvency

#### Military investment is a prerequisite to broader OTEC commercialization

PBN 10, Pacific Business News, Ocean Thermal Energy Conversion, <http://www.bizjournals.com/pacific/print-edition/2010/11/12/ocean-thermal-energy-conversion.html?page=all> MWimsatt

While many in the industry feel that the technology is ready, it’s untested. There is no data on maintenance costs, possible environmental impacts on the marine environment or potential engineering problems that could arise with a full-scale model — not an enticing combination for private investment.

It’s a bit of a double-edged sword. The pilot is needed to produce the information necessary to attract investment for a large-scale model, but it won’t come close to producing electricity at a competitive price with oil, which was trading at $88 a barrel earlier this week. As a result, investors will not be able to recoup costs or earn a return without government subsidies or military funding.

So far, Lockheed has secured about $14.5 million from the Department of Energy and Navy for technology risk reduction and the preliminary design of the pilot. No funding for the actual project is currently available, and Lockheed’s commitment for further funding is unknown at this time.

“We need to line up funding to build the pilot, which will depend on the comfort level of the Navy,” said Chris Myers, vice president of energy and government projects for Lockheed Martin.

The Navy has a particular interest in OTEC as it could be deployed throughout the Pacific Rim where there are military bases.

#### They can do OTEC

Crowe 10, Robert Crowe is a technical writer and reporter based in San Antonio, Texas. He has written for Bloomberg, the Houston Chronicle, Boston Herald, StreetAuthority.com, San Antonio Express-News, Dallas Business Journal, and other publications. He covers renewable energy and sustainability for various publications. As a consultant, he works closely with companies to develop technical materials for renewable energy and sustainability strategies, The US Military's Two-pronged Renewable Energy Initiative, <http://www.renewableenergyworld.com/rea/news/article/2010/09/the-us-militarys-two-pronged-renewable-energy-initiative> MWimsatt

“Having that vision and support from the leadership has been a tremendous asset and really been reflected in the way the Navy and Marine Corps stepped up to meet those goals,” Hicks said.

The Navy is particularly proud of its research in hydrokinetic energy projects that use ocean currents near Puget Sound and Hawaii, he said. The Navy also has established an ambitious goal for half of its facilities to become net-zero by 2025. Naval commanders are looking to accomplish the goals through a combination of energy efficiency initiatives and renewable energy projects. The Navy installed about 30,000 smart meters throughout its facilities last year.

### Offshore Wind Solvency

#### The navy is capable of developing offshore wind technology

Clark ‘9 (9/16/9, Eugene, United States Department of Energy, “Navy-NREL Offshore Wind MIDLANT Region Feasibility Study”, http://www4.eere.energy.gov/projects/dod/projec t/navy-nrel-offshore-wind-midlant-region-feasibility-study)

Naval Engineering Command (NAVFAC) and the National Renewable Energy Labratory (NREL) are collaborating to determine the feasibility of offshore wind farms for Navy power in the Mid-Atlantic Region (MIDLANT) offshore of the state of Virginia.

The NAVFAC MIDLANT region facilities include Norfolk Naval Station, Naval Base Little Creek, and Naval Air Station Oceana, which receive power from Dominion Power of Virginia. On the order of 1000 megawatts of installed wind turbine capacity potential exists for seafloor land offshore of the state of Virginia. The department of the Interior Minerals Management Service is in the process of issueing block land leases for development of renewable energy on this land. In particular, the seashore offshore of the Dam Neck Annex of Naval Station Oceana is ideal for development of offshore wind because the depth of water is less than 100 feet for as much as 12 miles distance from shore, and the Dam Neck Annex is an ideal location for share landing of a power cable and interconnection to the Dominion Power electrical grid through a substation.

### Weather / Climate Monitoring Solvency

#### Navy submarines hold the key for monitoring weather patterns and climate change --- it shares info with civilian agencies like the NOAA

Tucker 14 (3/14/14, Patrick, “Navy Submarine Drones Will Predict the Weather Months In Advance,” http://www.defenseone.com/technology/2014/03/navy-submarine-drones-will-predict-weather-months-advance/80542/)

In the next decade, Navy scientists will be able to predict the weather as far as 90 days into the future with the help of mathematical models, satellites, and submarine drones.

The mathematical models are the most important element in the ocean and weather prediction cocktail. But making those models perform at a level where they can be reliable so far into the future requires data from everywhere, including more places under the sea. That’s where the submarine drones make the difference.

Improved data from drones is one of the key elements of making naval environmental forecasting significantly better in the years ahead, Navy Research Lab scientist Gregg Jacobs said.

Today, the Slocum glider is the most recognizable drone that the Navy and others use in research. These 5 foot-long sea robots collect data on their environment every few seconds and can descend to depths of 4,000 feet. The Navy plans to increase the number of those drones from 65 to 150 by 2015.

Submarine drones like the Slocum collect data on salinity and temperature at various spots in the ocean. For the Navy, that’s key to figuring out where to park submarines since temperature and salinity can determine how fast sound can travel. Finding the right spot can make a parked submarine much more difficult to detect. But the bigger value of the undersea drones is all the data they’ll contribute to ocean models and our ability to predict future weather.

The Slocum isn’t the only underwater drone the military is developing. In its fiscal year 2015 budget request, the Defense Advanced Research Projects Agency wants $19 million for its Upward Falling Payload Program to “develop forward-deployed unmanned distributed systems [drones] that can provide non-lethal effects or situational awareness over large maritime areas.” That’s a spending increase of nearly 60 percent over last year.

Today, researchers use separate models to forecast for the ocean, atmosphere, waves and ice. This approach is inconsistent, according to Jacobs. He says that bringing together lots of different models and methods of measurement “in a single system modeling the whole earth environment will bring consistency and extended range forecasts out to 90 days” within the next decade.

The Navy is trying to make that happen in a couple of ways. First, there’s the Navy Ocean Forecast System, a complex computer program that uses meteorology, oceanography, satellite and sensor data to see into the future of the ocean, allowing a detailed view into the physics of water. The Navy uses this information specifically to predict the behavior of eddies, or big swaths of ocean currents. They work sort of the way atmospheric cold and warm pressure fronts do, but while cold fronts are often the size of continents and move over a span of days, eddies are hundreds of kilometers large and move over periods of months. They can also be extremely deep and hard to analyze.

The Navy recently announced a deal to share the Navy Ocean Forecast System software with the National Ocean and Atmospheric Administration.

Not only will sea bots help researchers understand the ocean in greater detail, they’ll also allow the Navy to know how much confidence to put into a forecast at any one time. That’s key, since knowing what the weather might be in three months is less important than knowing when your model is breaking down.

“Forecasts have errors,” Jacobs said, “sometimes large and sometimes small and the errors vary across different areas and throughout the forecast time. Taking the uncertainty in the forecast into account is critical in operation decisions from tactical to strategic. This tells planners where and when significant risk lies for the operations because of larger uncertainty in the forecast.”

That may not sound terribly exciting until you consider that the ability to rapidly update weather predictions, and avoid overconfidence in bad predictions, helped the allies win perhaps the most famous battle of 1944 when meteorologist Sverre Petterssen demonstrated the feasibility of short-term weather prediction based on the precise collection of weather data. He was instrumental in helping the allies successfully launch the D-Day assault on the beach at Normandy.

“During the World War II D-Day invasion planning, he and other meteorologists convinced Dwight Eisenhower to postpone the operation by one day rather than the proposed 14 days. The acceptance of the one day delay saved lives. This work was followed by Lewis Richardson who proposed a method of forecasting weather by solving the governing equations through a computational technique. At the time the process was proposed in 1922, there was not computational power to apply the method. The proposed method has provided the basis for what is conducted in environment forecasting now,” Jacobs said.

### Ocean Exploration / Mapping Solvency

#### The Navy’s UAVs can map the seafloor, collect data, research the oceans, and be outfitted for any other tasks mandated by the plan

[**ALMEIDA**](http://gcaptain.com/author/rob/)**12** (MARCH 7, 2012, ROB is an author and Partner of gCaptain http://gcaptain.com/department-defense-explore-ocean/)

Hydroid, Inc. a Kongsberg Maritime subsidiary, announced today that they had delivered a new deep-diving Autonomous Underwater Vehicle (AUV) to the Woods Hole Oceanographic Institution (WHOI) for use by the US Navy.

remus 6000 auv autonomous underwater vehicle hydroid

The REMUS 6000 AUV is the deepest member of Hydroid's growing family of AUVs. The vehicle boasts the same proven software and electronic subsystems found in Hydroid's highly successful REMUS 100 AUV. Image courtesy Kongsberg

The REMUS 6000 AUV, as it’s name suggests, is capable of diving to depths of up to 6,000 meters and was designed under a cooperative program involving the Naval Oceanographic Office (NAVOCEANO), the Office of Naval Research (ONR) and WHOI in support of deep-water autonomous operations.

“Our engineers and technicians will develop and install system enhancements to the standard vehicle, as well as perform system testing prior to delivery to the Navy,” said Tom Austin, principal engineer at WHOI. “Once the vehicle is delivered, we will continue to provide operational support.”

Although the vehicle was purchased by WHOI as the primary AUV platform for new sensor and system integration enhancing NAVOCEANO capability for Navy missions, the ultimate end user for this REMUS 6000 is NAVOCEANO, which acquires and analyzes global ocean and littoral data and provides specialized and operationally significant products and services to all elements within the Department of Defense. This most recent vehicle procurement by WHOI will eventually operate as part of the existing fleet of REMUS 6000 vehicles that the Navy utilizes for deep ocean operations, thus increasing their overall operational capabilities.

“The deep-diving REMUS 6000 is in a class of its own,” noted Christopher von Alt, President and one of the co-founders of Hydroid. “It was designed to autonomously carry a payload to great depths in order to measure ocean water characteristics and map the seabed. It’s also incredibly versatile, which makes it an ideal tool for NAVOCEANO’s operations. We’re pleased to continue our tradition of providing solutions for partners such as NAVOCEANO and WHOI.”

Hydroid’s REMUS AUVs are modular and may be fitted with a large number of different types of sensors and have been used to aid in hydrographic surveys, harbor security operations, scientific sampling and mapping, as well as many basic and applied research programs funded by ONR, DARPA and the UK Ministry of Defense.

#### The military should develop a national ocean mapping system—best expertise and experience

Medina, Smith and Sturgis 14 (January 14, Monica Medina, Joel Smith and Linda Sturgis, Monica Medina previously served as a Special Assistant to the Secretary of Defense and a Principal Deputy Assistant Secretary for Oceans and Atmosphere at the National Oceanic and Atmospheric Administration. Joel Smith is a Research Associate for the Energy, Environment and Security Program at the Center for a New American Security. Commander Linda Sturgis is the United States Coast Guard Senior Military Fellow at the Center for a New American Security Center for a New American Society, “National Coastal Ocean Mapping”, <http://www.cnas.org/sites/default/files/publications-pdf/OceanMapping_MedinaSmithSturgis.pdf>)

Informed decisions require good data. To exemplify the importance of transparency and data sharing, the Coast Guard initiated the Atlantic Coast Port Access Route Study to evaluate vessel routing from Florida to Maine and assist the Bureau of Ocean Energy Management’s efforts to identify priority areas for offshore wind energy development. Data from automatic identification systems to track vessel movements were used to create a comprehensive view of current shipping routes, allowing analysts to depict the concentration of vessel movements and approaches to ports along the eastern seaboard. The data provide a useful starting point for discussions about port access and vessel routing and efforts to preserve navigational safety in conjunction with offshore energy development proposals.28 This is an era of “big data” and ever-increasing amounts of publicly available information. Ocean users should strive to foster information sharing, improved cooperation and conflict avoidance. As the environmental compliance administrator, the Council on Environmental Quality should encourage government agencies to use coastal ocean mapping to ease the administrative burden of complying with federal statutes and regulations. A comprehensive coastal ocean mapping system – based either on an existing platform, such as ocean.data.gov or on entirely new software – should compile, integrate and analyze the available data. Those data need to be collected in a holistic manner for all major activities in the coastal ocean, and they should include overlays describing such characteristics as water depth, bottom type, currents, shipping routes, marine protected areas, commercial and recreational fishing grounds, projected oil and gas lease sales, and military training areas. Using the standardized data collection methods, this system would produce region-specific maps based on the unique characteristics of each area. A publicly accessible and user-friendly mapping system could provide users and regional planning bodies with essential tools for national ocean planning. Given the U.S. military’s history of researching and acquiring technology to advance coastal ocean awareness, we recommend that it lead the mapping effort, with input from public and private stakeholders. The military should invest in the development of a national coastal ocean mapping system that would provide regional planning bodies with a unified tool for ocean planning. Conclusion The development of a national coastal ocean mapping system would benefit all coastal ocean users and is an integral step toward more effective and thorough ocean planning. Through comprehensive awareness of major offshore activity, the United States would simultaneously advance national security, economic development and ocean conservation.

#### Military has been key to exploring the ocean

Military Analysis Network’98 (“The Oceans and National Security” http://fas.org/man/dod-101/navy/docs/nat\_sec\_316.html)

U.S. Oceanography since World War II11

World War II thrust the United States into global affairs, and its many sea campaigns not only drew public interest to the ocean but highlighted our lack of understanding of it. Most members of the small marine science community turned to military oriented work in uniform, in the civil service, or at universities and related institutions. Academic ships, as well as those of the federal government, were put on Navy research and surveying tasks. The Navy needed oceanographic help in everything from submarine warfare to amphibious landings. This assistance contributed to the war effort and demonstrated to the nation that marine science was more than an abstract endeavor and could contribute to the public good on many levels.

Since World War II, the United States has been a world leader in most areas of oceanography. Vannevar Bush’s Science: The Endless Frontier is still the classic statement of the essential ingredients of scientific excellence. He noted that "without scientific progress, no amount of achievement in other directions can ensure our health, prosperity, and security as a nation in the modern world. This essential new knowledge can only be obtained through basic scientific research." The plan of Vannevar Bush for government support of university science led to the formation of the Office of Naval Research (ONR), which is charged with ensuring the development of strong academic research programs in scientific fields of interest to the Navy. The Cold War and the threat from both surface vessels and, particularly, submarines led ONR to conclude that expanding and strengthening the basic science of the ocean were in the national interest.

The postwar and post-Sputnik periods from 1960 to 1980 were marked by growing national awareness of the world and an intense interest in science. In marine science, interest broadened globally , leading to such major ocean-related programs as the International Geophysical Year, the Deep Sea Drilling Project and the International Decade of Ocean Exploration. While originally responsible for the postwar academic expansion of oceanography, the Navy is progressively concentrating its support in a more limited number of Navy-relevant areas, but continues to provide some oceanographic research vessels to U.S. academic institutions and provide research opportunities for use of specialized platforms12.

Oceanographic research studies with national security implications include hydrodynamics, marine life, the interaction of seawater with ocean boundaries, ocean acoustics, and geoacoustics. Knowledge of the exchanges of energy, heat, and mass at the ocean-atmosphere interface is important to climate and weather prediction. Oceanographic research has advanced from the past era of exploration to one of increased observation and description of oceans systems and interactions with the atmosphere.

### Ocean Wreckage / Salvage Solvency

#### Navy nuclear subs are the most effective at finding and recovering ocean wreckage

**Bilyeu, 7** (December 4th 2007, Bilyeu Works in the Public Affairs Office at Submarine Base, New London, http://www.navy.mil/navydata/cno/n87/usw/issue\_14/nr1.html)

Homeported at Naval Submarine Base New London in Groton, Connecticut, **the nuclear-powered submarine NR-1 performs underwater search and recovery, oceanographic research, and the installation and repair of equipment - down to depths of one-half mile below the surface of the ocean.** A unique member of the Navy's submarine community, NR-1 has claimed the Battle Efficiency "E" in the "Special Boats" category for seven consecutive years.

NR-1: Exploring Naval History on the Ocean Floor

by JO3 Braden Bilyeu

One of the Navy's most scientifically advanced vessels is aiding an effort off the North Carolina coast to recover and restore a legendary Civil War ship that was an engineering marvel for its time.

USS Monitor, pictured below, sank in 1862, and today lies upside down at a depth of 250 feet.

NR-1's crew and capabilities were put to the test in February 2002 during a one-month deployment in support of the Navy Monitor Project, which ran in tandem with the National Oceanic and Atmospheric Administration's (NOAA) 2001 Monitor Expedition. The overall goal of this joint effort is to recover and restore key artifacts of the historic Civil War-era vessel. USS Monitor served as the Navy's first ironclad warship. Launched on 30 January 1862 at the Continental Iron Works on Long Island, New York, the ship is most famous for its confrontation with the Confederate ironclad, CSS Virginia, in the Battle of Hampton Roads on 8 March 1862. The battle ultimately turned out to be a draw - with both ships firing on each other at point-blank range but unable to inflict serious damage on the other. In the resulting stalemate, Monitor was successful in protecting the rest of the Union fleet lying off Fort Monroe, while Virginia delayed a further Union advance toward Norfolk. Monitor's Navy career was destined to be short-lived, however. Shortly after midnight on 31 December 1862, while under tow to Beaufort, North Carolina, she sank in a gale-force storm off Cape Hatteras. Later rediscovered, her sunken and rusting hull became America's first national marine sanctuary in 1975. Today, Monitor lies upside down at a depth of 250 feet, resting on the displaced and inverted turret002E

The Navy has been deeply involved in all aspects of Monitor research and recovery, and the work-up for the Monitor Project has been extensive. Archaeologists, structural engineers, and corrosion experts have studied the wreck for more than two years. Prior to NR-1's arrival, Navy divers completed a five-month effort to recover the Monitor's innovative steam engine and a section of her hull. Operations are currently under way to recover other major components of the vessel, and the propeller has already been brought up.

NR-1's role in the most recent phase of the operation was to conduct a full visual and sonar survey of the historic ship, and her unique capabilities were well matched to the task. The endurance of nuclear power, and ducted thrusters fore and aft for maneuverability, are some of NR-1's most bankable features. Her box keel houses two retractable tires, which allow helmsmen to guide the ship along the contour of the ocean floor. [Editor's Note: See "NR-1 - Within Visual Sight of the Bottom," in the Summer 1999 issue of UNDERSEA WARFARE.]

This side-looking sonar image reveals the most detailed view of Monitor ever taken. NR-1's deep submergence capability provided a stable platform for its powerful camera and sonar equipment to go to work. The different colored layers indicate specific depth. At its highest point near the stern, Monitor rises 15 feet above the ocean floor. NR-1's powerful side-looking sonar captured images of the outline of Monitor's inverted hull. The faint horizontal lines running across the ship is the skeleton of Monitor's ironclad framing.¶

This is a side-view artists rendition of the current position of the Monitor on the sea floor. Note that the turret has slipped off and is visible, even though the ship is upside down.

Because of strong currents along the bottom, previous efforts to obtain extensive, detailed footage at the site had failed, but NR-1's exceptional stability made it possible to scan the entire hull and study the ship's structural integrity with relative ease. "Approaching the Monitor, you get a real sense of its historical significance," said ETC (SS/DV) Mike Uherek, NR-1's Chief of the Boat. "I've been on a lot of missions, but the experiences from this one are going to stay with me for a long time." According to Uherek**, NR-1's** sonar capabilities played a central role in this stage of the expedition. "Our side-looking sonar covers the ocean floor and creates a profile image of all objects on the bottom. But both crew and equipment had to perform at their best in our passes over the Monitor," he said.

"From a deep submergence vessel, we have the ability to actually look through the window and get a first-hand view of everything on the bottom of the ocean," said MM1 (SS) Mike Reilly, First Lieutenant of the boat. Reilly's duties as First Lieutenant include maintaining the submarine's hull systems and penetration ducts, line-handling, and other general tasks. He came aboard NR-1 just in time to deploy for the Monitor Project. According to Reilly, few ships rival the research submarine when it comes to "seeing" underwater. She is equipped with both side-looking and obstacle-avoidance sonars, three viewing ports, and a variety of cameras that record both stills and motion picture footage. The cameras, a total of 13 in all, are positioned around the ship's exterior and are capable of panning in almost any direction.¶

NR-1's ability to remain at one location and generate a comprehensive and accurate bottom map has been a valuable asset on several occasions. Its nuclear propulsion system gives NR-1 exceptional endurance on station, even in heavy weather. **Some of the ship's more notable assignments have included participation in the investigation of wreckage of EgyptAir Flight 990, which crashed into the Atlantic Ocean** off Nova Scotia on 31 October 1999. **She also searched for, identified, and recovered critical parts of the Space Shuttle Challenger following the tragic shuttle disaster** in 1986. NR-1 also performs military missions suited to her unique capabilities.

For the crew, NR-1 duty is almost as unique as the submarine itself. The craft carries a complement of 11 submariners, all of whom are nuclear-propulsion certified. Aside from the traditional command structure of Officer-in-Charge, Executive Officer, and Chief of the Boat, the rest of the crew is almost entirely enlisted, usually ranking between E-6 and E-7. All crewmembers are also qualified to stand duty as Officer of the Deck and Officer of the Watch.

Because of the limited space available for onboard equipment, NR-1's galley is really no more than a sink, a small oven, and a single cold-storage unit. The lone washroom aboard conspicuously lacks any shower facilities, and even on a ship manned by only 11 people, the crew must still eat and sleep in shifts. But in spite of the close quarters and lack of creature comforts, NR-1 is never far away from a warm meal and more modern conveniences. The submarine is usually towed to and from remote locations by a chartered commercial vessel, the Carolyn Chouest, which serves as both an auxiliary research platform and submarine tender for NR-1.

"We have one of the best support ships in the entire fleet in Carolyn Chouest," said MM1 (SS/DV) Bryan Wallace. "The crew is very squared away, and they take very good care of us while we're underway. The food is a lot better over there, too," he added. The Carolyn Chouest also supports the crew by serving as a communication link to friends and family during NR-1 deployments. Twice daily, the Chouest downloads e-mail for the crew and relays it to the boat by radio. The crew can respond in the same manner.

Submariners who apply to serve aboard NR-1 undergo a rigorous selection process, including a personal interview with ADM Frank L. "Skip" Bowman, Director of Naval Reactors. Once selected, the new crewmembers begin a thoroughgoing orientation and training program before taking on their unique and often challenging new duty.

"NR-1 is not easy duty. It's definitely not for the faint of heart," said MM1 Wallace.

During his years in the Submarine Force, Wallace gained the kind of broad-based work experience that NR-1 requires, including tours on the fast-attack submarine USS Miami (SSN-755) and the Pre-Commissioning Unit (PCU) Virginia. "Although our primary crew is made up of senior enlisted nuclear-trained personnel, we occasionally receive junior Sailors who are sent here for a nine-month tour," Wallace said. "And we tell them, 'By the time you leave, you will do more and see more than you will in a full tour on any other ship in the Navy.'

Caption follows A rare view of the underside of NR-1 reveals a combination of sophisticated lighting and camera equipment, capable of capturing still and motion imagery from any number of angles. NR-1 also has a number of unique features, including three view ports, which allows crew-men to establish direct visual contact with the ocean floor. At the very bottom of the sub, the box keel houses NR-1's wheel bases and manipulator arm.

" NR-1's youngest crewmember, ET1 (SS) Jeff Schwamb, was quick to back up that assertion. As a junior Sailor, his first orders after nuclear-power training sent him to a nine-month stint on NR-1. Following that assignment, Schwamb went on to serve on the fast-attack submarine USS Seawolf (SSN-21), but two years later he came back to NR-1. Onboard, he is responsible for the operation of the camera equipment and the condition of the ship's internal forward computer systems. And like the rest of the crew, he enjoys the challenge and the uniqueness of his work.

"Everything they say about the amount of work here is true," he said. "Each division on the ship has a maximum of three people - but you still have the same amount of work and maintenance to do as you would on another boat with a bigger crew. But the thing about working on a submarine with 11 people - as opposed to 120 - is that everything you do here is a lot more hands-on. You definitely know that you're making an impact," Schwamb said.

Although **her participation in the effort was completed in just three days**, **the contributions** NR-1 and her fast-working crew have made **to the Navy** Monitor Project **will continue to reverberate over the long term. Later this year, the Navy** and NOAA **plan to go after Monitor's turret**, the largest piece of the ship to be raised thus far. And now, **thanks to NR-1, they know exactly where to find it.**

JO3 Bilyeu works in the Public Affairs Office at Submarine Base, New London.

#### The military can salvage, dredge, boost navigation, monitor the oceans, and deploy icebreakers

**US Commission on Ocean Policy 7** (August 11th 2007, US commission on Ocean Policy “ENHANCING OCEAN INFRASTRUCTURE AND TECHNOLOGY DEVELOPMENT” http://govinfo.library.unt.edu/oceancommission/documents/full\_color\_rpt/27\_chapter27.pdf)

In addition to ship-based monitoring programs, **much of the coastal and open ocean**

**monitoring supported by the federal government is conducted using buoys and in situ sensors.** In addition to the buoys themselves (discussed below), both NOAA and the  
Coast Guard maintain the ships needed to deploy and care for buoys in the open ocean.  
The development of the Integrated Ocean Observing System (IOOS), discussed in detail  
in Chapter 26, will intensify the demand for ship support to install and maintain ocean  
buoys. This capability is not available in the federal fleet today, nor is it foreseen in the  
near future.

Other **routine activities such as marine salvage, dredging, ensuring safe navigation,  
and monitoring offshore oil and gas activities also require significant support.** While most salvage in the United States is conducted by private contractors, both the Coast Guard and **the Navy maintain** some **assets for these activities.** **In particular, the Navy has four manned rescue and salvage ships and several unmanned underwater vehicles.** Like salvage activities, most port and waterway dredging projects are conducted by private companies under contract (over 160 contracts were granted by USACE in fiscal year 2003); however, USACE  
does keep a small fleet of twelve dredging vessels throughout the country to help maintain  
navigable waterways. **The Coast Guard conducts icebreaking activities to permit vessels to move safely on frequently traveled routes. In particular, the Coast Guard owns and operates thirteen primary icebreaking vessels (some of which are also used for research as discussed above) and conducts numerous ice reconnaissance flights** using HC-130 aircraft.  
As part of its mandate to oversee oil and gas activities in the outer Continental Shelf, MMS

must monitor coastal and ocean areas for oil spills. This responsibility is carried out primarily through a fleet of contract helicopters that are used to transport inspectors to over 4,000 offshore oil and gas platforms annually.

### Ocean Research Solvency

#### Navy created robot can be used for ocean monitoring, exploration and oil spill cleanup

Neuman, 13 (3/29/2013, Scott, “U.S. Navy Funding Development Of Giant Jellyfish Robot,” http://www.npr.org/blogs/thetwo-way/2013/03/29/175713635/u-s-navy-funding-development-of-giant-jellyfish-robot)

We've already seen drones shaped like various animals, including humming birds and dogs. Next is one made to look (and swim) like a jellyfish.¶ ¶ Cyro, which measures 5 feet 7 inches in diameter and weighs 170 pounds, moves through the water effortlessly, researchers say. Its design is based on Cyanea capillata, the giant lion's mane jellyfish indigenous to the cold waters of Arctic, the northern Atlantic and Pacific oceans.¶ ¶ It is being developed at a lab at Virginia Tech, funded by a grant from the U.S. Naval Undersea Warfare Center and the Office of Naval Research. There's a video at Geek.com, which says:¶ ¶ "Cryo consists of a central core of components in a waterproof shell connected to eight moving arms. Draped over this is a large and soft piece of white silicone, which comes into contact with each of the arms and remains flexible. Combined, the arms and silicone act as a propulsion system mimicking how real jellyfish move around."¶ ¶ Discovery News says it will be used for "ocean monitoring, exploration, and even clean-up in the case of an oil spill":¶ ¶ " ... the team hopes Cyro can operate underwater continuously for weeks or even months. That's the goal anyway. Next the engineers say they want to refine the robot, reducing energy consumption and improving its swimming abilities in collaboration with several partner universities."¶ ¶ The article doesn't say, but considering where the source of funding for the five-year project and Cyro's superb ability to camouflage at sea, it would be a fair guess that it's being considered for more than just taking water temperatures and cleanup.

#### The navy has been able to use research of the oceans to create useful tech

Military Analysis Network’98 (“The Oceans and National Security” http://fas.org/man/dod-101/navy/docs/nat\_sec\_316.html)

Beyond Ocean Scientific Research: Civil Applications

Over the years, practical oceanic research has resulted in spin-offs which benefit everyone worldwide. Navigation charts and aids are the prime example of a naval contribution which benefits civilian mariners worldwide. The National Imagery and Mapping Agency (NIMA) is chartered to provide DoD-wide mapping, charting, and geodesy support. Under the Navy’s direction, NIMA is producing digital replications of traditional paper nautical charts to support the Navy’s transition from paper to digital navigation products. Known as Digital Nautical Charts (DNC),™ these digital charts allow near real-time display of one’s own GPS position and significantly enhance the safety of navigation at sea. Through joint efforts between the Navy and NIMA, new survey sounding information will also be seamlessly incorporated into future editions of DNC™. NIMA’s world leadership in the production of digital charts holds considerable promise for the civil sector.

The Navy also took the lead in providing LORAN and the two-dimensional TRANSIT satellite navigation system for maritime navigation. These programs led to the development of the current standard, the joint three-dimensional NAVSTAR global positioning system (GPS). GPS relies in part on space-borne clocks developed by the Naval Research Laboratory’s Timation program13. Mariners worldwide benefit from these navigation aids.

The research into secure and reliable means of maritime communication has extended into the civilian sector. Financial institutions are studying methods engineered for the military for safe, reliable, and rapid means of moving large volumes of data, secure from the danger of disruption or unauthorized monitoring. The Internet, the result of communications programs funded by the Department of Defense, has provided incalculable benefits worldwide. There are countless other examples of the fruits of military research spilling over into the field of marine engineering, marine environmental and pollution control technology, meteorology systems, communications, and biology.

### Arctic Solvency

#### Navy can explore and develop the Arctic

**Hansen** [**12**](http://www.earthmagazine.org/tags/april-2012) (April 2012, Kathryn was an Associate Editor at EARTH, where she reported on polar science, geotechnology, weather, natural hazards, geopolitics, and space. “U.S. Navy navigates a sea change in the Arctic” <http://www.earthmagazine.org/article/us-navy-navigates-sea-change-arctic>)

Last September, at the international Arctic Forum in the Russian city of Arkhangelsk, Prime Minister Vladimir Putin compared new Arctic shipping routes to the Suez Canal. The Northern Sea Route, he said, which follows the country’s northern coastline, would dramatically shorten trade routes between Europe and China.¶

The new shipping routes are possible due to the declining extent and thickness of summer Arctic sea ice. Although completely ice-free summers in the Arctic Ocean are not expected for at least another three decades, impacts of the decline are already evident: For two consecutive years, the Northwest Passage and Northern Sea Route have been passable for ship traffic during summer months. In addition to opening new shipping passages, an increasingly accessible Arctic is attracting increased resource exploration, scientific research and even tourism. Shipping companies, entrepreneurs, scientists and tourists, however, are not the only ones looking north; militaries around the world, including the U.S. Navy, also have an interest.¶

“As sea ice decreases, accessibility of the region increases and therefore human activity in the region is increasing and will continue to increase,” says Cmdr. Blake McBride, Arctic Affairs Officer for the Navy’s Task Force Climate Change. “The Navy, by virtue of our global mission, provides stability to international commerce and global order, which allows for a common prosperity. This means we need to ensure we are able to operate and have a presence wherever and whenever human activity is occurring in the maritime environment.”¶ Toward that mission, the Navy has created a task force, developed a roadmap, and employed a corps of geoscientists to synthesize scientific information. About halfway through the roadmap’s five-year timeline, planning continues and scientific challenges remain.¶

A New Normal¶

Arctic sea ice grows each year to an annual maximum extent during the dark, cold winter and spring, and then retreats through the summer to reach its annual minimum extent in September. In 2007, scientists tracking Arctic sea ice from satellites watched as a record-breaking melt season unfolded. Starting in June, the extent of Arctic sea ice retreated swiftly and by August the ice had already fallen below the previous melt record set in 2005. Finally, on Sept. 16, 2007, sea-ice extent dropped to just 4.13 million square kilometers, 38 percent below average since the start of the satellite record in 1979. The record melt that year could be attributed in part to warm temperatures and an alignment of conditions just right for melting the ice, including sustained periods of clear skies and warm winds.¶

Extremes aside, however, scientists say that the Arctic has entered a “new normal.” In December 2011, NOAA issued the annual Arctic Report Card. Last year saw the second-lowest sea-ice extent on record, but it’s not just the ice that has changed. Near-surface air temperatures in 2011 were 1.5 degrees Celsius above the 1981-2010 baseline period. Ocean temperatures and salinity levels appear to be stabilizing after a period of warming and freshening. And Arctic lands look to be greening up.¶

That the Arctic is changing is not news. The sea-ice extent has declined by 12 percent per decade since 1979, and the ice is thinning too. Model results from the University of Washington Applied Physics Lab showed that the volume of Arctic sea ice in January 2012 was 41 percent lower than in 1979. Thickness matters because compared to thick multiyear ice, thin first-year ice can more easily melt or be pushed around and broken up by storms.¶

“With a greener and warmer Arctic, more development is likely,” said Monica Medina, NOAA principal deputy under-secretary of commerce for oceans and the atmosphere, in a NOAA statement about the Report Card. At a press briefing in December to roll out the report, she noted that the changes would affect decisions about oil and gas exploration activities and plans being made for the next five years. The Navy, however, is looking even further into the future and trying to ascertain what the Arctic might look like as much as 30 years out — about the time it takes to design and build new ships. “To justify expenditures, we need information about the expected environment,” McBride says. “If we don’t have plans, it’s hard to argue for what we’ll need in order to operate in that environment. What kind of ships will we need? What roles, missions, responsibilities, and organizational structures might need to change?”¶

Establishing a Plan¶

Even before the so-called “new normal” was described this year, scientists and the Navy had a good idea that sea ice was thinning. The Navy’s exploration of the Arctic started almost a century ago with flights by Rear Adm. Richard Evelyn Byrd Jr. starting in 1926. It continued during World War II, and then, in 1958, the Navy made the first submarine transit of the North Pole in the USS Nautilus. Since then, submarines have maintained a presence in the Arctic for training and research, some of which has contributed to volumetric estimates of the ice from below. The Navy has also worked closely with academic institutions to collaborate on ice camps and expeditions, such as Science Ice Exercise (SCICEX), which from 1995 to 1999 collected geological, physical, chemical and biological data from the Arctic Ocean, and ICEX, a submarine exercise during which the Navy practices working in Arctic conditions.¶

For a continued presence in the Arctic, however, the Navy faces challenges from the changing Arctic landscape, so the Navy set out in April 2001 to establish a plan. That year, the Office of Naval Research, the Arctic Research Commission, and the Naval Ice Center hosted the first symposium on Naval Operations in an Ice-Free Arctic, at which participants discussed naval operations and national strategic issues. A follow-up symposium in 2007 took the discussion further to explore impacts on commercial transportation, oil and gas exploration, fisheries, and scientific research.¶

In 2009, former President George W. Bush signed a national security presidential directive establishing a national Arctic policy. The policy calls on the departments of State, Homeland Security and Defense to implement the policy through specific actions, such as: “Develop greater capabilities and capacity, as necessary, to protect United States air, land and sea borders in the Arctic region,” and “Consider, as appropriate, new or enhanced international arrangement for the Arctic to address issues likely to arise from expected increases in human activity in that region …” It also details several directives to promote international scientific cooperation, including the accurate prediction of the future Arctic climate and environment. Although the policy does not call for specific new naval missions, the Navy is nonetheless considering the directive goals in strategic planning.¶ “Our primary objective is to ensure naval readiness and capability and promote maritime security in the Arctic region,” McBride says. “This readiness will ensure that the Navy is prepared to operate in the Arctic if or when called upon to do so.”¶

Also in 2009, the chief of naval operations established Task Force Climate Change, headed by the Navy’s senior oceanographer Rear Adm. David Titley. Navy geoscientists “ensure an understanding of the physical environment, allowing the Navy to operate safely on the world’s oceans,” McBride says. “Task Force Climate Change is an extension of that, and our role is to characterize the environmental changes of the future and the challenges that these changes will present to the Navy.”¶

Deliverables¶

Toward that effort, one of the first deliverables of the task force was a strategic roadmap, a five-year plan of actions and milestones designed to guide Navy policy, investment, action, and public discussion on the Navy’s role and actions concerning the Arctic.¶

In accordance with the roadmap, the task force issued its first Arctic Environmental Assessment and Outlook Report in August 2011. The document is designed to inform Navy policy by providing an environmental assessment of the Arctic, updated every two years to align with Navy budget and decision-making cycles. The report synthesizes existing scientific information for climate, ocean and land mass trends, and then provides an outlook for resource exploration. It then describes tactical, operational and strategic implications for naval activities, which often relate back to the difficulty of operating in the harsh northern latitudes. For example, ice and even the northern lights can impede communication. Freshening ocean water can change acoustical propagation. And Arctic weather is not easy to accurately forecast.

In a separate task force-sponsored activity, the U.S. Naval War College conducted an exercise called Fleet Arctic Operations Game 2011. In September, 88 participants from the military, academia and industry participated in the four-day tabletop game that sought to explore gaps in maritime operations and to find solutions to those gaps.¶

“The key finding of the game is that the U.S. Navy is inadequately prepared to conduct sustained maritime operations in the Arctic,” says Walter Berbrick, a professor in the U.S. Naval War College’s War Gaming Department. “This was primarily due to the poor reliability of current capabilities as well as the need to develop new partnerships, ice-capable platforms, logistics infrastructure, satellite communications and educational and training initiatives.”¶

Also, the game found that as weather and climate conditions intensify — particularly the presence of ice, strong winds and fog — and as the total time and distance traveled during an operation increase, the greater the risk of mission failure and loss of or harm to friendly forces, Berbrick says. “To reduce risk, players relied on additional information and capabilities through partnerships with the U.S. Coast Guard, Joint Task Force Alaska, tribal leaders, industry and multinational partners.”¶

Pushing Boundaries¶

Geographically, there are just five nations in the Arctic Council — an intergovernmental forum to promote cooperation, coordination and interaction among Arctic countries — that have Arctic coastlines: Canada, Denmark/Greenland, Norway, Russia and the United States. Of those nations, only the United States lacks a national Arctic strategy. Unlike a clear national strategy, the U.S. Arctic policy does not provide guidance on how to invest and prioritize, McBride says. “But that’s more of a near-term problem for the Coast Guard than the Navy,” he says: The Coast Guard has needs now, such as to develop its icebreaking fleet, but the Navy, he says, “has time to prepare.”¶

Still, it’s unclear exactly how much time the Navy has to prepare. Estimates of when the Arctic will have fully ice-free summers range anywhere from 2040 to 2060. And the U.S. National Petroleum Council, an advisory committee that relays the views of the oil and gas industry to the Secretary of Energy, reported in the Navy’s Arctic Environmental Assessment and Outlook Report that some technology necessary to exploit oil from the Arctic might not be ready until 2050. “If you act too soon, you’re wasting taxpayer dollars because you’re ahead of need, but if you wait too long you’ll have a crisis and spend too much too quickly,” McBride says.¶

As such, Task Force Climate Change is trying to plan ahead to make the best use of dollars at the right time. But that can be easier said than done, as many scientific questions remain about the Arctic’s future. To obtain answers, the Office of Naval Research is pushing scientific boundaries with two Department Research Initiatives (DRI). The first, “Predictability of Seasonal and Intra-seasonal Oscillations DRI,” looks to support improvements in climate modeling. This research would lay the foundation for the Navy’s interest in long-range predictions. The second, “Marginal Ice Zone DRI,” looks to improve the knowledge and understanding of the physics of the retreating summer ice edge and marginal ice zone in the Beaufort and Chukchi seas. Little is known about the point where sea ice gives way to open water, such as how (or if) waves or the sun impact its retreat and thickness.¶

Also during the last fiscal year, the Office of Naval Research started an Arctic research program, designed to improve the basic understanding of the Arctic environment, as well as to monitor and predict environmental change. The program will require that new platforms, sensors and communications be developed and operable in extreme conditions.¶

“Overall we see the greatest challenge in climate understanding to be the state of climate computer modeling,” McBride says.” A new proposal called Earth System Prediction Capability is meant to address the issue, touted as the next step in numerical weather prediction.¶

The proposal grew out of discussions between the Department of Commerce and Department of Defense about how the next environmental analysis and prediction system could meet requirements of a zero-hour to three-decade prediction system, to support everything from short-term weather forecasts to seasonal agriculture and energy needs to decadal-scale infrastructure development. The proposal is not without technical challenges, however, and depends on advances in computational capability and the reformulation of existing earth system models.¶

#### The Navy can explore the Artic with a scientific focus

**Smally** [**14**](http://science.dodlive.mil/2014/04/23/ice-breaker-onr-researchers-explore-a-changing-arctic/) (April 23, 2014, David is an author at the Department of Naval Research.

<http://science.dodlive.mil/2014/04/23/ice-breaker-onr-researchers-explore-a-changing-arctic/>)

As sea ice continues to recede at a record pace in the Arctic, officials at the Office of Naval Research (ONR) on April 14 announced new efforts to determine the pace of change in what some are calling Earth’s final frontier.¶

Scientists sponsored by ONR have traveled to the Beaufort Sea in the Arctic Ocean, placing new sensors in the ice and in the frigid waters below, to better understand the processes contributing to a dramatic decline in sea ice thickness and extent-and provide new tools to help the U.S. Navy predict conditions and operate in once-inaccessible waters.¶

“A changing Arctic means significant new responsibilities and opportunities for the scientific and research communities, the nation and our allies,” said Rear Adm. Matthew Klunder, the chief of naval research.¶

“ONR researchers, working in one of the world’s most challenging environments, will give U.S. naval planners the essential data we need.”¶

The effort, which includes partnership with the government of South Korea, involves aircraft and icebreakers to deploy sensors to compile and coordinate new data on rapidly changing conditions, particularly as it applies to the Marginal Ice Zone (MIZ), where ice and open ocean meet.¶

ONR scientists aim to assist Navy planners not only in short-range (zero-five days) but long-range (six or more months) timeframe predictions in these areas where the ice is located between solid pack ice and the sea.¶

“Where we have had ocean models and weather models, we clearly need new ice models as well,” said Scott Harper, MIZ project manager for ONR. “We need better operational predictions-sailors and ships are at risk without higher resolutions and shorter forecasts.”¶

The effort to gain knowledge about new waterways in once-inaccessible regions supports a directive from Chief of Naval Operations Adm. Jonathan Greenert, who has made understanding changes in the Arctic a priority.¶

“The U.S. Navy recognizes that the opening of the Arctic Ocean has important national security implications as well as significant impacts on the U.S. Navy’s required future capabilities,” he noted in the U.S. Navy Arctic Roadmap 2014-2030.¶

“Today, the observed changes in the Arctic Region climate and the reduced extent of summer sea ice reveal the potential for the Arctic Ocean to become a more viable route for international shipping over the coming decades.”¶

The director of the Task Force Climate Change and Oceanographer of the Navy, Rear Adm. Jon White, emphasized the importance of the research.¶

“ONR’s research focus is aligned with the Navy’s Arctic Roadmap Implementation Plan, and will help us better understand and predict an environment that will still continue to present significant challenges for surface and air operations,” said White. “While there is much preparation the Navy needs to do before it starts conducting routine operations in the Arctic, understanding the dynamic environment and the rate of change is a critical foundation for these future operations.”¶

ONR’s research into Arctic environmental conditions will focus on three major areas: sustained observation of the Arctic Ocean environment; better understanding frozen ocean processes; and developing computer models and prediction methods that look at how air, ice, ocean and waves will respond to climate change.¶

The five-year analysis of the MIZ will utilize a combination of some of the most advanced technologies, including ice mass balance buoys, wave buoys, ice-tethered profilers, autonomous gliders, ocean flux buoys, remote sensing and more.¶ ONR researchers say the detailed study will provide essential new data for the Navy.¶

“There’s a lot more open water in the Arctic Ocean today, so there are significantly greater waves and swell,” said Harper. “That didn’t happen before, and we need to give sailors every possible tool to operate safely in new environmental conditions.”¶

By David Smalley, Office of Naval Research¶

### Marine Pollution Solvency

#### The Coast Guard can monitor marine pollution—recent Shell lawsuit proves

Cockerham 13 (March 27, 2013, Sean Cockerham, Anchorage Daily News, “Coast Guard wants Shell drill rigs to get pollution investigation”, http://www.adn.com/2013/03/27/2842580/coast-guard-asking-justice-dept.html)

WASHINGTON -- The Coast Guard has asked the Justice Department to investigate possible pollution violations by both of the drilling rigs Shell used in its botched efforts to explore for oil last year in the Arctic Ocean waters off the northern coast of Alaska.Coast Guard Rear Adm. Thomas Ostebo said Wednesday that he'd turned over to the Justice Department for review and possible prosecution an investigation into the troubled Shell drilling rig Kulluk. Ostebo said it was an "investigation into potential Marpol violations."Marpol is short for marine pollution, and it's a name used to refer to the International Convention for the Prevention of Pollution From Ships. The Coast Guard earlier had sent the Justice Department a list of 16 safety and environmental violations by the other rig used in Shell's Arctic efforts, the Noble Discoverer. "As the Coast Guard and Department of Justice are still actively engaged in these investigations, it would not be appropriate for me to provide additional information at this time," Ostebo said at a Senate hearing in Anchorage chaired by Alaska Democratic Sen. Mark Begich. > Shell Alaska Vice President Pete Slaiby said at the hearing that he also wouldn't discuss any matters under investigation, but he defended Shell's efforts. "Our drilling operations were completed safely and successfully. . . . It was while leaving the theater of operations that issues with the Discoverer were identified by the Coast Guard and the Kulluk ran aground," Slaiby said. The Kulluk was grounded for several days off Kodiak Island after a New Year's Eve storm. Ostebo, who's the Coast Guard's commander for Alaska, said the grounding was an "event that highlights the rigors of operating in Alaskan waters." According to Shell, the Kulluk departed Dutch Harbor on Wednesday morning on a dry-tow vessel for inspection and repairs at a shipyard in Singapore. Ostebo said the Coast Guard was investigating the Kulluk grounding with help from experts with the National Transportation Safety Board and the Bureau of Safety and Environmental Enforcement. Such an investigation might several take months to complete. The Noble Discoverer was found to have 16 violations after a Coast Guard inspection at the end of November. They included pollution control problems and a finding that the vessel couldn't go fast enough to maneuver safely in rough Arctic conditions. The rigs were able to drill only a partial well apiece. The Interior Department says Shell won't be allowed to drill the Arctic waters again until it presents a plan that shows it can handle the conditions. "Shell screwed up in 2012," Interior Secretary Ken Salazar said this month. Shell has dropped plans to drill in Arctic waters this year in the wake of the problems, but the company promises to return at a "later stage." Shell has spent more than $4.5 billion on its efforts to drill off the Alaska coast. David Lawrence, Shell's executive in charge of exploration in the Arctic and the rest of North America, has announced that he's resigning from the company. Lawrence told Dow Jones Newswires last year that the drilling off the northern coast of Alaska would be "relatively easy." Last summer, Shell began drilling its first wells in two decades in Alaska's Arctic waters. "It marked an historic re-entry into the U.S. Arctic offshore. . . . The first step to validating the enormous offshore resource potential," Shell executive Slaiby said Wednesday. Environmental groups are calling on the Obama administration to shut down the Arctic offshore drilling program, but the president has declined to do so. "The administration is committed to supporting safe and responsible exploration of potential energy resources in frontier areas such as the Arctic," Bureau of Ocean Energy Management Director Tommy Beaudreau said Wednesday.

### Fishing / Marine Protection Solvency

#### The Coast guard is a key actor to enforcing maritime and fishing regulations

Jones ’11 (8/29/11, Ocean and Coastal Law Journal of the University of Maine School of Law, Matthew, “ENFORCEMENT OF U.S. FISHERIES LAWS IN THE EEZ: AN ILLUSTRATION OF THE VALUE OF THE COAST GUARD’S DEEPWATER MISSIONS TO THE NATION AND THE NEED TO PROVIDE IT WITH ADEQUATE DEEPWATER RESOURCES”, http://mainelaw.maine.edu/academics/oclj/pdf/vol13\_2/vol13\_oclj\_281.pdf)

The Coast Guard is the only U.S. agency able to conduct at-sea enforcement of fisheries laws, as it alone is capable of projecting the required law enforcement presence in the “deepwater” environment.27 Consequently, in order for the United States to ensure successful protection of its fishery resources, the Coast Guard’s Integrated Deepwater System (IDS) must be properly funded. IDS, which currently is planned to be a twenty-five-year acquisition program, will provide the Coast Guard with the deepwater assets necessary to perform its many important missions. These assets include new and refurbished cutters, cutter small-boats, fixed-wing aircraft, helicopters, and unmanned air vehicles, as well as state-of-the-art command–and–control electronic equipment.28 Presently, funding for IDS has been piecemeal, which has, and continues to, undermine the entire program.29

The Coast Guard has the duty to “enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States.”53 Furthermore, the Act specifically provides that its provisions “shall be enforced by the Secretary [of Commerce] and the Secretary of the department in which the Coast Guard is operating.”54 Thus, “living marine resource enforcement is a joint responsibility of both NOAA Enforcement and the U.S. Coast Guard, with assistance from [other federal and state agencies].”55 The Coast Guard, however, acts as “the lead agency for at-sea enforcement of living marine resource laws” as it is “the only agency with the infrastructure and authority to project a law enforcement presence throughout the [EEZ,]”56 while NOAA provides enforcement of the laws ashore.57

#### The Coast Guard enforces marine protected areas and reserves

Davis and Moretti ‘5 (6/15/5, , Marine Protected Areas Center with the National Oceanic and Atmospheric Administration Coastal Services Center, Braxton C. Davis and Greg S. Moretti “Enforcing US Marine Protected Areas: Synthesis Report”, http://marineprotectedareas.noaa.gov/pdf/publications/enforcement.pdf)

The U.S. Coast Guard (USCG), which was recently moved to the Department of Homeland Security, has maintained broad responsibilities for enforcing offshore Marine Protected Areas established under federal authorities (Table I). However, the USCG is a multi-mission, military service, and has a host of other responsibilities related to maritime safety, national defense, maritime security, mobility, and the protection of natural resources. The new focus on Homeland Security could conceivably draw resources and priorities away from the enforcement of natural resource regulations due to new training, operations, and strategic planning activities; however, increases in federal funding for the agency will also increase fixture law enforcement capacities. The primary example of this is found in the new "Integrated Deepwater System" (IDS) program, which involves the replacement and upgrading of all USCG cutters and aircraft over the next twenty years, in addition to the acquisition of numerous command, control, and communications assets (USCG 2004a)

The U.S. Coast Guard has several large offshore patrol vessels based in Key West that are used in conjunction with sanctuary patrol vessels for enforcement of the Tortugas Reserves, in addition to other USCG missions. Sanctuary and USCG officers have traditionally cooperated through joint patrols, training, equipment, and occasionally on enforcement actions for significant violations. For example, sanctuary officers have flown with Coast Guard aircraft to spot zone violations, and the Coast Guard recently contributed C-I30 overflights to a sanctuary case. The USCG has the authority to enforce sanctuary regulations under the National Marine Sanctuaries Act (16U.S.C. 1431 et seq.).

### Sea Turtle Solvency

#### The Navy can research sea turtle migrations and habitats with GPS and tracking technology

**National Aquarium 13** (December 13th 2013, National Aquarium “How Satellite Tagging Is Teaching Us About Sea Turtle Migration” http://nationalaquarium.wordpress.com/2013/12/13/how-satellite-tagging-is-teaching-us-about-sea-turtle-migration/)

The National Aquarium and Virginia Aquarium & Marine Science Center recently partnered to release four juvenile loggerhead sea turtles named Findlay, Rooney, Portsmouth, and Grenada at Sandbridge, Virginia on October 20, 2013. The animals were all treated for a range of injuries and illnesses and were in rehabilitation for varying amounts of time. While all four animals have unique rescue and rehabilitation stories, three of the four now have one significant factor in common – they are all taking part in a significant piece of research!

national aquarium animal rescue, rooney release national aquarium animal rescue, portsmouth release **The U.S. Navy is supporting the conduction of research that will provide valuable insights into sea turtle habitat** use of the Chesapeake Bay and coastal Virginia waters. **The project funds the deployment of acoustic transmitters and satellite tracking tags on rehabilitated and released sea turtles with the goal of learning more about residency times, migration intervals, and foraging areas within the Bay and its surrounding waters.**

Acoustic transmitter tags work by emitting a sound signal or ‘ping’ that can be detected by networks of underwater receivers, commonly referred to as arrays. These acoustic monitoring arrays are installed in many coastal areas, including the Chesapeake Bay and have been valuable for understanding migration patterns and habitat use for many fish species, including endangered species of sturgeon!

Each tag transmits a specific coded signal that is used to identify the individual as it moves from one location to another. As the turtle moves around areas where receiving arrays are present, the arrays detect the pings from the tag and record the information, which is later downloaded by researchers for analysis.

Findlay, Rooney, and Portsmouth were also equipped with data logging satellite telemetry tags produced by Wildlife Computers and the Sea Mammal Research Unit. **These tags can record the behaviors such as dive depth and duration and transmit that data back to researchers via satellites. In addition to the recorded data, each transmission also includes the GPS coordinates of the individual so that their movements can be tracked over long ranges.**

## Atlantis / Alvin Solvency Mechanism

### Alvin Owned by U.S. Navy

#### Alvin is owned by the U.S. Navy --- does deep ocean exploration

Humphris et. al 14 --- Woods Hole Oceanographic Institution (6/3/2014, SUSAN E. HUMPHRIS, CHRISTOPHER R. GERMAN, and J. PATRICK HICKEY, EOS, TRANSACTIONS, AMERICAN GEOPHYSICAL UNION, “Fifty Years of Deep Ocean Exploration With the DSV Alvin,” Wiley Online Library Database)

This week the Deep Submergence Vehicle (DSV) Alvin, the world’s first deep- diving submarine and the only one dedicated to scientific research in the United States, celebrates its 50th anniversary.

Owned by the U.S. Navy and operated by the Woods Hole Oceanographic Institution (WHOI), Alvin has provided unprecedented access to the deep ocean, enabling extensive observations as well as data and sample collection for investigating physical, chemical, geological, and biological processes. Its pioneering work has led to rapid technological developments in deep submergence vehicles that have greatly expanded scientists’ abilities to conduct research throughout this vast and remote environment.

### Alvin Allows for Seafloor Discoveries

#### Alvin has historically contributed to important seafloor discoveries.

Humphris, et. al, 14 --- Woods Hole Oceanographic Institution (6/3/2014, SUSAN E. HUMPHRIS, CHRISTOPHER R. GERMAN, and J. PATRICK HICKEY, EOS, TRANSACTIONS, AMERICAN GEOPHYSICAL UNION, “Fifty Years of Deep Ocean Exploration With the DSV Alvin,” Wiley Online Library Database)

Alvin’s Decades of Ocean Exploration

Alvin’s first major undertaking was in response to an urgent request from the U.S. Navy in early 1966. An Air Force B-52 bomber had collided with a tanker over Spain, dropping a hydrogen bomb in the Mediterranean Sea. A 2-month search operating from a landing ship dock was successful and proved Alvin’s ability to conduct operations at the seafloor.

In 1971, the head of the French Centre National pour l’Exploitation des Oceans proposed a joint U.S.-French expedition with WHOI to explore the Mid- Atlantic Ridge using human- occupied submersibles. In 1972, with the approval of the U.S. National Academy of Sciences but amid doubts by many scientists about how useful submersibles might be, funds were granted for Project FAMOUS ( French- American Mid- Ocean Undersea Study) to dive to about 3000 meters on the Mid- Atlantic Ridge between 36°N and 37°N. In 1973, Alvin’s steel personnel sphere was replaced with a titanium one that extended Alvin’s diving range from 6000 feet (~2000 meters) to 12,000 feet (~3650 meters). This was the first time in history that scientists descended to a midocean ridge [Ballard et al., 1975]. This successful project proved that submersibles could effectively explore the seafloor and marked the beginning of a new era of seafloor exploration.

Alvin is perhaps most celebrated for investigations in 1977 and 1979 of seafloor hydrothermal systems and their associated chemo synthetic ecosystems, including giant tubeworms and clams, on the Galápagos Rift, one of the most profound discoveries of the late 20th century [Corliss et al., 1979]. The existence of distinct seafloor chemosynthetic ecosystems (Figure 2a), which thrive on energy stored in reduced chemicals from the Earth rather than energy from the Sun, revolutionized our views of where and how life can exist on Earth and perhaps elsewhere in the universe.

Discovering Hydrothermal Vents and Photographing the Titanic

In 1979, at 21°N on the East Pacific Rise, scientists in Alvin discovered black smokers (Figure 2b) discharging high- temperature (350°C), acidic, reducing, and metal- rich fluids [Spiess et al., 1980]. This marked the beginning of numerous Alvin expeditions that discovered hydrothermal vents along the global mid- ocean ridge system in the Pacific and Atlantic Oceans.

One project particularly riveted the attention of the general public and made Alvin a household word: its photographic documentation of the wreck of RMS Titanic discovered in 1985 with a towed camera system. A year later, on its dives to the Titanic (Figure 2c), Alvin deployed a prototype remotely operated vehicle, Jason Jr., that was able to penetrate the wreck and take stunning images of the sunken vessel.

Over the following decades, Alvin discovered new seafloor environments that harbored other chemosynthetic communities. Since 1983, when scientists in Alvin discovered chemosynthetic communities at cold seeps on the Florida Escarpment [Paull et al., 1984], Alvin has supported numerous investigations of hydrocarbon and saline seeps on the continental slope of the Gulf of Mexico. Although the underlying conditions that drive seeps differ from those of hydrothermal vents, chemical- rich fluids at seeps similarly provide energy to sustain lush microbial mats and communities of tubeworms, mussels, and clams [Cordes et al., 2009].

The Lost City Hydrothermal Field

More recently, Alvin was part of an expedition that discovered the Lost City hydrothermal field on 1.5- million- year- old crust at 30°N, Mid- Atlantic Ridge, where seawater reacts with mantle rock (peridotite) to produce methane and hydrogen and build 60-meter-tall carbonate chimneys [Kelley et al., 2001]. Credit for these discoveries should be shared with the Alvin pilots whose experience from many dives positions them well to recognize something “different” at the seafloor.

In 2010, Alvin took part in a national response to the Deepwater Horizon oil spill disaster. The expedition examined dead and dying corals discovered just 7 miles from the well head. Alvin worked in tandem with the autonomous underwater vehicle Sentry to gauge the response of benthic communities to oil exposure in the deep Gulf of Mexico [White et al., 2012] (Figure 2d).

#### New upgrades mean Alvin can explore more of the seafloor.

Humphris, et. al, 14 --- Woods Hole Oceanographic Institution (6/3/2014, SUSAN E. HUMPHRIS, CHRISTOPHER R. GERMAN, and J. PATRICK HICKEY, EOS, TRANSACTIONS, AMERICAN GEOPHYSICAL UNION, “Fifty Years of Deep Ocean Exploration With the DSV Alvin,” Wiley Online Library Database)

Alvin in 2014 and Beyond

In December 2010, after 4664 dives, Alvin was taken out of service to undergo a major upgrade funded by the National Science Foundation and WHOI. A new, larger, titanium, 6500-meter personnel sphere with five, rather than three, viewports was integrated into Alvin’s modified frame. The upgraded Alvin is equipped with fiber optic penetrators, a new command- and- control system, improved lighting and high- definition imaging, and increased data-logging capabilities. The new Alvin (Figure 1b) returned to service in March 2014, picking up where it left off with studies in the Gulf of Mexico. Diving to 6500 meters awaits development of batteries with greater energy density suitable for a human- occupied vehicle. Once that capability is realized, Alvin’s research potential will be expanded to being able to work in 98%, rather than 65%, of the ocean.

When Allyn Vine first conceived of using submarines for scientific research, he could never have predicted the discoveries that have been made as a result of sending humans to explore the deep ocean. As Vine observed, “I find it difficult to imagine what kind of instrument should have been put on the Beagle instead of Charles Darwin” [Vine, 1957]. In the same spirit, Alvin will continue to be a workhorse for exploring Earth’s deep oceans for decades to come.

### Search and Rescue Solvency

#### Research Vessel Atlantis can be used on search and rescue missions

WHOI 11 (11/28/11, Woods Hole Oceanographic Institution, “WHOI Statement on the R/V Atlantis Rescue at Sea of 93 Egyptians,” <http://www.whoi.edu/page.do?pid=83503&tid=3622&cid=122349&c=2>)

**The research vessel Atlantis**, operated by Woods Hole Oceanographic Institution (WHOI), **rescued 93 Egyptians aboard a disabled fishing boat in the Mediterranean Sea** late Friday night (Nov. 25).¶ Atlantis was commencing an oceanographic research expedition, steaming toward its first study site, when it was diverted by a mayday call at 9 p.m. from a fishing boat that was relayed to all nearby ships by the Greek Coast Guard. Atlantis responded to the call and began the rescue, coordinating with the Greek Coast Guard and the Rescue Coordination Center.¶ Following standard security procedures, Atlantis Captain A.D. Colburn III raised the ship’s U.S. Coast Guard Maritime Security Level from I to II and took protective measures to secure non-crew members inside the vessel, locking all exterior hatches and portholes before boarding the Egyptians.¶ **By midnight, all 93 men were aboard the deck of Atlantis**, a ship that had 50 crew, technicians, and scientists aboard. The fishing boat was abandoned with its lights and power on, its position radioed to the Greek Coast Guard.¶ The Atlantis crew provided blankets, pillows, and clothing, including dry socks for the Egyptians, who had been standing in water aboard their boat and were cold, hungry, and dehydrated. Atlantis’s cook gave them loaves of bread and other food. Crew members stayed on deck with the Egyptians through the night, as Atlantis diverted 88 miles to the Greek port of Kalamata.¶ Atlantis arrived in Kalamata at 8 a.m. Saturday. The Egyptians disembarked and were processed by Greek officials. After Captain Colburn gave his statement to authorities, Atlantis departed Kalamata at 10:30 a.m. to return to its research mission Sunday.¶ In a statement to “all hands” aboard Atlantis, Captain Colburn wrote: “On the behalf of WHOI, I would like to commend you for your efforts during the rescue of 93 persons on the fishing boat last night. Foremost on our minds was the safety of the persons needing rescue and also the safety of all aboard Atlantis. We all can be proud that we did our duty as seafarers. It was a long and satisfying night, knowing we helped others in need. Now let's concentrate on our science mission.”

### Gulf Solvency

#### Military tech key to mapping and drilling in the Gulf

Friedman 6 (September 2006, Barry, American Association of Petroleum Geologists, “Scientists Get First Hand View ‘Deep Seep’ Communities Visited,” <http://archives.aapg.org/explorer/2006/09sep/mms_deep.cfm>)

How deep? About seven times farther than the longest of Barry Bonds’ blasts -- 3,280 feet (1,000 meters) -- to the floor of the Gulf of Mexico.¶ Specifically, the project, “Expedition to the Deep Slope,” used manned submersibles in May-June to explore and survey for the first time the hard bottom habitats and seeps located on the lower continental slope of the Gulf.¶ The intent was to learn more about the chemosynthetic communities that are commonly associated with near surface or surface gas hydrates, which have been suggested as a clean-burning fuel for the future.¶ And while the Gulf was the region targeted, the team involved in studying a resource that could eventually have global significance was truly international: “Deep Slope” attracted scientists from as far away as France, Germany and Russia.¶ AAPG member Harry Roberts, co-chief scientist at Louisiana State University (where he teaches and advises graduate students in the Department of Oceanography and Coastal Sciences), said the project was unique not just because of what they were looking for, but how they went looking for it.¶ “Very little direct observation and sampling using a manned submersible had been done” in past expeditions of this type, said Roberts, who was on the trip. “The objectives were to study the communities and surface geology and geochemistry of natural hydrocarbon seeps and vents.”¶ MMS, part of the Department of the Interior, oversees the production of about 23 percent of the natural gas and 30 percent of the oil produced in the United States, and is generally responsible for the management of offshore energy and minerals on the 1.76 billion acres of the Outer Continental Shelf. It spent more than $3 million on this expedition trying to find “essential” information on “the ecology and biodiversity of these deep-sea communities,” said Penn State professor Chuck Fisher, another of the project scientists.¶ The Gulf’s northern and northwestern continental slope are the most mature deepwater oil and gas provinces in today’s oceans -- and clearly, the Gulf is prolific. But naturally occurring fluid and gas expulsion processes not only produce unusual chemosynthetic communities, they also can cause geohazards. As such, federal law requires oil and gas companies to both avoid and protect the chemosynthetic communities.¶ It’s not unlike the warnings given by your local utility company: Call before you dig.¶ “It is to everyone’s benefit,” says Roberts, who believes that good working relationships between the groups are essential, “to follow the rules currently on the books that protect the environment, but to also allow for aggressive exploration and production to move forward into even deeper water of the Gulf.”¶ Adding to the urgency of understanding what’s down below is the fact that seven of the top 20 oil fields in the United States (ranked by liquids proved reserves) are now located in federal deepwater areas.¶ According to MMS, deepwater fields in the Gulf of Mexico contribute 1 to 1.6 million barrels of oil a day produced in federal waters in the Gulf of Mexico.¶ Two teams -- consisting of 25 scientists, including microbiologists, physiologists, ecologists and a middle school science teacher -- used an R/V Atlantis and the Alvin submersible to dive on sites, as Roberts mentioned, never visited “in person” before. A professional crew based at Woods Hole Oceanographic Institution maintained and operated the Alvin.¶ Once there, the collection of scientists tried to answer the following:¶ Where are chemosynthetic habitats located?¶ What is the diversity of animals living in these exotic communities?¶ How do these species interact with each other and with their environment?¶ How are chemosynthetic communities in different parts of the world’s ocean connected?¶ How do physical and biological processes facilitate or hamper these connections?¶ Currently, there are 15 structures operating in water depths greater than 1,000 feet, and Roberts says most of the work in the last decade has concentrated on the upper slope, above that height.¶ “We really didn’t know if chemosynthetic communities would be plentiful below this depth,” he said. “They are!”¶ Specifically, he says, “The diversity of animals was greater than we expected. Many new deepwater life forms are now in the process of being described and entered into the scientific literature.”¶ Some of the areas explored are those that will soon be drilled for oil and gas by energy companies, Roberts said.¶ Efficient Effort¶ Roberts said this trip was not only a success, but efficient.¶ “Little time was wasted traveling over featureless mud bottom,” he said, as all sites selected had seepage and chemosynthetic communities.¶ Both cross-slope and along-slope variability in chemosynthetic communities, as well as geologic characteristics, were tested, and the results emphasized the dynamic geologic framework of the northern Gulf’s continental slope, where the interplay of salt that deforms when loaded with sediment has created many “leak points for oil and gas to reach the modern seafloor.”¶ Roberts, whose work specializes in developing a detailed understanding of both the geologic and biologic impacts of fluid and gas expulsion on the modern sea floor, said these sites support unusual biologic communities as well as exotic surficial geology such as mud volcanoes, rocky mounds and hardgrounds, and brine streams and lakes.¶ Data will now be studied, but already the enthusiasm is evident for the project’s next step.¶ “Many of the organisms were new species,” he said. “We will go back next year.”

### Oil Spill Solvency

#### Military funding and equipment allows scientists to monitor the impacts of oil spills

Schleifstein, 14 (3/14/14, Mark, Gulf of Mexico Research Initiative, “Researchers to Use Alvin Sub To Study Mile-Deep Seafloor Near BP Well Blowout,” <http://gulfresearchinitiative.org/researchers-use-alvin-sub-to-study-mile-deep-seafloor-near-bp-well-blowout/>)

A team of scientists led by University of Georgia marine biologist Samantha Joye will spend most of April using the deepsea submarine Alvin to study the mile-deep seafloor near the **site** of BP's ill-fated Macondo well for the lingering effects of the 87-day flow of oil and gas following the blowout that sank the Deepwater Horizon drilling rig in April 2010.¶ Alvin carries three scientists and has made more than 4,300 dives since its launch in 1964, with some dives traveling nearly three miles deep. It was used to find a lost hydrogen bomb in the Mediterranean Sea in 1966, discovered deep-sea hydrothermal vents in the late 1970s and explored the sunken ocean liner Titanic in 1986.¶ The team will use the U.S. Navy's research submarine in a series of dives near the Macondo wellhead, allowing them to record observations with the use of high-definition cameras and to collect water, sediment and biological samples from the seafloor.¶ "No one has visited these sites in a human-occupied submersible since 2010, so we are very eager to evaluate the health of these locations firsthand," Joye said in a news release announcing the trip. "Populations of many organisms living in the water and on the ocean floor were seriously damaged by the blowout, so we want to know how things have changed since December 2010."¶ The scientists will study areas where the seafloor was covered with oil in 2010, staying outside a 2 nautical mile circle around the wellhead.¶ "We particularly want to know if the oil-contaminated sediment layers are still there," she said. "It may be buried beneath a layer of sedimentation, but its effects could still be profound and we will be able to assess this."¶ Joye was the leader of several independent research cruises using submersible vehicles to track the effects of the oil spill in the months immediately following the spill. She was part of a team that quickly published a peer-reviewed paper that explained that a significant percentage of the hydrocarbons released by the wells were traveling as methane gas in a miles-long plume between 3,200 feet and 4,800 feet beneath the surface, and another study that found oil droplets or microbes that ate the droplets rained down on a large area of the seafloor around the well, including on deepwater coral reefs about 10 miles north of the well.¶ In April, the researchers also will visit a series of natural seeps of oil that are between 75 and 300 nautical miles away from the wellhead, part of a long-term microbial observatory research project that is examining the role of hydrocarbon-rich, salty brine fluids that are expelled naturally from the seafloor on fluid and sediment geochemistry and microbiology.¶ "Brine-influenced habitats are analogs to ancient habitats on the Earth," Joye said. Their study helps in understanding how similar biogeochemical cycling occurred on the ancient Earth, and could result in the discovery of new microorganisms, she said.¶ Other researchers aboard the R/V Atlantis, which acts as the mothership for the Alvin, are from the Georgia Institute of Technology, Florida State University, University of North Carolina and Coastal Carolina University.¶ The research is being fundedwith a grant from the National Science Foundation and from the Gulf of Mexico Research Initiative's Ecosystem Impacts of Oil and Gas Inputs to the Gulf program.¶ The National Science Foundation is funded by the federal government. The Gulf of Mexico Research Initiative is funded by a $500 million grant made by BP soon after the spill. It has an independent board of directors that determine how grants are awarded, with no input from BP beyond that the research be aimed at issues involving the blowout accident and its aftermath.¶ The Alvin is operated by the Woods Hole Oceanographic Institution for the National Deep Submergence Facility. This will be the first major research operation for the underwater research platform following a two-year renovation that increased its seating capacity.¶

## Solvency --- China Coop Plank

### Modeled by China / Solves Climate & Relations

#### The counterplan will be modeled by China --- promotes clean energy revolution, solves climate change and promotes close strategic relations

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

D. Towards a lasting U.S.-China Relationship--Shared Interests Driving Global Innovation During RIMPAC in 2012, the U.S. Navy demonstrated the power of energy innovation by sailing the Great Green Fleet across the Pacific Ocean. n294 The Chinese military leadership was intrigued and asked the Commander, U.S. Pacific Command, why they were not invited to participate. n295 The Commander looked to include the Chinese in future humanitarian and disaster relief missions, and Secretary Panetta followed with a full invitation to participate in the 2014 iteration of the exercise. n296 As the PLAN looks to project Chinese power farther across the globe, it will look to the United States Navy as its model. Seeing the effectiveness of clean energy investment, China will pursue a similar strategy. The U.S. defense and state departments, and their constant interactions with their counterparts in China, will play a vital role as the initiators and sustainers of a U.S.-Chinese partnership in the Green Arms Race. Pursuing energy innovation will successfully align the domestic and international interest of the United States and China. Local constituencies will be able to localize the benefits of a more efficient and more capable military and more reliable and diverse sources of energy. Defense innovation will create new jobs and spark entrepreneurship in both countries, and consumers will have access to spill over clean and efficient energy technologies. A durable partnership on energy between the United States and China will also allow for strong leadership on climate change. As mentioned above, the developing world, knowing that energy consumption was tied closely to economic growth, ignored climate change and burned cheap carbon--the West was responsible for the bulk of the problem--and should bear the lion's share of the cleanup. The problem, of course, is that we all live on the same planet and Asia now finds itself on the front lines of an increasingly malignant problem. In a recently published article, the former President of the [\*717] Republic of Maldives, Mohamed Nasheed, and the Former President of East Timor, Jose Ramos-Horta, called for Asian Climate Leadership. n297 To successfully reach an agreement at the next UN Climate Summit next year in Paris, they argue that three things need to happen. First, old positions must be abandoned and countries must work together towards a global deal. n298 Second, they urge Asian countries to build clean energy economies to boost growth, increase wealth, and reduce pollution. They highlight the need "[for] electricity grids that can accommodate vast quantities of renewable energy; infrastructure that promotes green vehicles; and regulations that encourage energy efficiency." n299 Third, they recommend that Asian nations better protect their natural environments. In both the United States and China, national security and mission accomplishment are more useful drivers for domestic support than broader and more abstract concepts like energy independence or the environment. n300 In his 2012 State of the Union address, President Obama explicitly used national security and the Defense Department to challenge legislators to take action on climate change and energy innovation. The President said: We can also spur energy innovation with new incentives. The differences in this chamber may be too deep right now to pass a comprehensive plan to fight climate change. But there's no reason why Congress shouldn't at least set a clean energy standard that creates a market for innovation. So far, you haven't acted. Well, tonight, I will. I'm directing my administration to allow the development of clean energy on enough public land to power 3 million homes. And I'm proud to announce that the Department of Defense, working with us, the world's largest consumer of energy, will make one of the largest commitments to clean energy in history--with the Navy purchasing enough capacity to power a quarter million homes a year. n301 [\*718] A strong U.S.-China partnership on clean and efficient energy innovation, driven by shared interests and military requirements, could build support domestically in both nations to bring about the very change President's Nasheed and Ramos-Horta seek. A secure, affordable, and clean supply of energy is a goal that the United States and China share. Defense collaboration on energy via regulatory, technical, and other exchanges will increase much needed military-to-military contact between the United States and China, which will reduce tension and risk and, over time, will stabilize the region. By framing energy in national security terms, the United States can galvanize global cooperation on innovation and climate change.

### Solves Climate Change

#### Solves global climate change better than the plan

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

IV. CONTINUOUS INNOVATION--TOWARDS A DIVERSE ENERGY FUTURE This article reorients the discussion on energy and climate change focusing it squarely around national security. Doing so allows American ideas and innovation to lead the world towards a new energy future, one that recognizes the benefits of clean and renewable sources of energy alongside fossil fuels. The United States can use its "Default Power" to ensure global stability and alter the future of our environment by engaging the developing world with reliable and efficient solutions to their energy concerns. The strategic rebalancing to the Asia-Pacific region provides the perfect opportunity to increase direct military-to-military interaction with China to encourage energy innovation to forge a clean energy future for the region, and for the world. The threats posed by climate change are shared by all nations. President Obama's National Security Strategy recognizes the "real, urgent, and severe" threat posed by climate change and notes that "change wrought by a warming planet will lead to new conflicts over refugees and resources; new suffering from drought and famine; catastrophic natural disasters; and the degradation of land across the globe." n347 Any solution to this problem must involve global cooperation. Sustained and meaningful cooperation on energy and the environment [\*725] between the United States and China, the two biggest users and polluters on the planet could change the trajectory of world energy consumption. We are at a transformational moment. The military's pursuit of energy innovation does not reflect a fringe environmental pursuit, but rather a necessary national security choice. Two cultures, traditionalist and alternative, east and west, will be united in this quest. The critical issues of energy security and climate change desperately require American leadership and innovation. We can protect our natural environment and produce a thoughtful energy policy that can be shared internationally through military and diplomatic interaction. Only by building a diverse, resilient, and efficient energy portfolio, one that expands opportunities to develop new energy supplies of all kinds, can the United States and China escape the short-term problems caused by price volatility and long term problems like climate change. The Green Arms Race provides the way. To save lives on the battlefield, better utilize limited tax dollars, and achieve greater operational capability, the military is leading an energy pivot towards efficiency and diversity. Technological advancements and effective regulations are being shared through defense networks across the globe. As the United States rebalances the force to the Pacific, the military will increase its interactions with the Chinese and add the world's largest energy consumer as a partner.

### Solves Asia Pivot / U.S.-China Coop / Chinese Environment

#### The counterplan strengthens U.S.-China strategic cooperation, solves China’s dirty energy use and promotes global energy innovation

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

III. THE ENERGY PIVOT U.S.-China relations are evolving. At the conclusion of then Chinese President Hu Jintao's state visit to the United States, he and President Obama released a joint statement. This statement reaffirmed each leader's "commitment to building a positive, cooperative, and comprehensive U.S.China relationship for the 21st Century." n242 Each country addressed the fears of the other, saying "the United States reiterated that it welcomes a strong, prosperous, and successful China that plays a greater role in world affairs. China welcomes the United States as an Asia-Pacific nation that contributes to peace, stability, and prosperity in the region." n243 [\*707] Since then, both nations have set about to achieve their stated goals. In November 2011, President Obama officially announced the strategic rebalancing of American attention and resources from the Middle East and Central Asia to the Asia-Pacific region. He stated: After a decade in which we fought two wars that cost us dearly, in blood and treasure, the United States is turning our attention to the vast potential of the Asia-Pacific region . . . Our new focus on this region reflects a fundamental truth--the United States has been, as always will be, a Pacific nation . . . As the world's fastest-growing region--and home to more than half the global economy--the Asia-Pacific is critical to achieving my highest priority, and that's creating jobs and opportunity for the American people ... I have, therefore, made a deliberate and strategic decision--as a Pacific nation, the United States will play a larger and long-term role in shaping this region and its future, by upholding core principles and in close partnership with our allies and friends. n244 To pursue his vision, President Obama developed a comprehensive, multi-dimensional strategy designed to: strengthen alliances; deepen partnerships with emerging powers; build a stable, productive, and constructive relationship with China; empower regional institutions; and help to build a regional economic architecture that could sustain shared prosperity. n245 The United States and China have increased their contacts and formalized their exchanges on strategic and economic issues. n246 Military-to-military contacts have resumed and high-level exchanges have occurred in various venues. n247 Even so, as interaction increases, so too do doubts and suspicions. On the American side of the Pacific, a "significant minority" n248 wonders what a strong China means for the United States. This camp sees China as aggressively trying to displace the United States as the dominant power in the Asia-Pacific region and form Asia into a bloc that defers to [\*708] Chinese economic and foreign policy objectives. n249 On the Chinese side, there is suspicion about whether American power will be used to help or hurt a growing China. They view the American pivot, increased military presence, and strengthened defense relationships with its neighbors as a coordinated effort to encircle their nation in order to prevent it from realizing its rightful place as Middle Kingdom. n250 This Part explores the possibility of bridging the space between the two cultures using defense-led energy innovation. In Part I, we saw how the military's mission is driving energy innovation and changing the very culture of the force. In Part II, we delved briefly into China's millennia-long history and examined the remarkable growth of the Chinese economy that is driving a worldwide resource quest that deploys whatever it needs in the economic, political, and military spheres to secure the fuel it requires. Now, with the stage set, we can see the effect increased military-to-military contact between the United States and China can have on the world's energy future. These interactions can demonstrate the power of efficient and clean energy innovation, further refine successful regulatory mechanisms, and slay the two-headed dragon of Pacific instability and environmental harm caused by the Asia-Pacific region's rapid industrialization. A. Aligning the Two Cultures In 1959, C. P. Snow delivered a lecture, "The Two Cultures," in which he lamented the cultural divide that separates the two areas of human inquiry, science and the arts. n251 Snow noted, There seems . . . to be no place where the cultures meet. I am not going to waste time saying that this is a pity. It is much worse than that . . . [A]t the heart of thought and creation we are letting some of our best chances go by default." n252 Snow went on to argue that artists and scientists must build bridges between their two disciplines to fully realize human progress. n253 This cultural separation has an analogue in the energy area. Domestically in the United States, cooperation and true progress are [\*709] hindered by the seemingly un-crossable chasm that exists between traditional defense hawks and those who support alternative energy. As we saw in Part I, the military mission has fulfilled C. P. Snow's vision and bridged the gap between the two energy cultures by reorienting the domestic energy discussion around national security. In order to better achieve its mission, the Defense Department is changing the way it uses energy on the battlefield and on board its installations. It is becoming more efficient and secure and is proving that energy innovation allows the force to achieve greater operational reach with less risk. We are in the midst of a quantum leap in military achievement in the energy area and it occurred by aligning the mission with energy innovation. There are potentially huge gains for the environment and military capability. With this alignment, the chasm was bridged and the clash between the two cultures produced creative advancements. While China and the United States have been important partners for the last fifty years, the relationship between the two also fits rather easily into Snow's paradigm. At 238 years old, the United States is an infant compared to China's national existence. The United States is a liberal democracy, and China is the largest communist country on earth. China views the West with suspicion, and the West is weary of a dominant China in East Asia. There is limited understanding of one side from the other, and direct and transparent conversation is nearly impossible. Issues like cyber security, currency manipulation, and human rights encounters are hot-button topics that make meaningful, or even open, dialogue impossible. However, seen through the lens of national security, energy aligns the interests of the two nations on a wide range of issues--energy security, economic growth, climate and environmental sustainability--and tremendous progress seems possible.B. A New Framework for Cooperation The rise of new powers has often led to conflict with established nations, but it does not have to. Understanding even the basics of China's history and culture will allow us to begin building bridges to span the divide between East and West. Perhaps most fundamentally, China does not see itself as a "rising" power, but as a returning power, displaced from its position only temporarily by Western colonial intervention and meddling. n254 [\*710] As we saw in Part II, earlier experiences with foreign intervention caused a decidedly nationalist hue to color China's view on international relations. Culturally, Chinese tradition holds that the Middle Kingdom is heir to an eastern empire that is peaceful, defense-minded, self-sufficient, and pacifist. n255 They see Western culture as expansionist, militaristic, shortsighted, and selfish. n256 Additionally, while China has opened its economy to world markets and embraced state capitalism, their view of the West remains informed by Marxist political thought, which holds that capitalist nations exploit the rest of the world. n257 Also, some Chinese leaders see America's support for Taiwan and calls for democracy as attempts to weaken the Chinese state and make it more pro-American. n258 This will help the United States win the perceived zero-sum quest for power and resources. The Chinese worst-case scenario is that the American pivot represents an attempt to increase military presence and western influence within Chinese territory. n259 Neither nation has experience dealing with a country of similar economic power, size, resources, self-confidence, or as different a culture or political system. China's history provides no precedent for how to relate to a nation like the United States--a great power with a permanent Pacific presence with universal ideals that do not necessarily comport with Chinese conceptions. n260 Continuing the evolution, at their June 2013 meeting in Rancho Mirage, California, Presidents Obama and Xi discussed a new model for U.S.-China relations moving forward. President Xi Jinping said: We're meeting here today to chart the future of China-U.S. relations . . . . We need to think creatively and act energetically so that working together we can build a new model of major country relationship. n261 [\*711] Just as increased American military presence in the Pacific could signal the threat of encirclement in Beijing, the flexing of Chinese muscle in the South China Sea and in neighboring countries gives rise to the fear of dominance in Washington. Defense energy programs provide a mechanism through which to forge a new type of power relationship. Luckily, the framework through which to collaborate on energy innovation is already in place. In 1979, soon after the United States and China opened formal relations, the two nations signed the Science and Technology Cooperation Agreement. n262 This agreement pledges cooperation in a diverse range of fields including physics and chemistry, earth and atmospheric sciences, health care and disease control, and a variety of energy-related areas. n263 In the face of the global challenges of climate change and energy security, in 2008, the United States and China entered the Ten Year Framework on Energy and Environment Cooperation, which, as the title suggests, facilitates exchanges between the two countries to foster energy innovation and environmental protection. n264 In November 2009, Presidents Obama and Hu established the $ 150 million U.S.-China Energy Research Center, which facilitates joint research and development on clean energy technology by teams of scientists from the United States and China. n265 Presidents Obama and Hu, in their Joint Statement in 2011, directly address cooperation on climate change, energy, and the environment: The United States and China agreed to continue their close consultations on action to address climate change, coordinate to achieve energy security for our peoples and the world, build on existing clean energy cooperation, ensure open markets, promote mutually beneficial investment in climate friendly energy, encourage clean energy, and facilitate advanced clean energy technology development. n266 Each side reaffirmed their commitment to continue exchanges on "energy policy and cooperation on oil, natural gas (including shale gas), civilian nuclear energy, wind and solar energy, smart grid, advanced bio-fuels, [\*712] clean coal, energy efficiency, electric vehicles, and clean energy technology standards." n267 Cooperation between the United States and China can drive global energy innovation. In his 2011 progress report on U.S.-China Clean Energy Cooperation, Secretary of Energy Steven Chu noted: Energy innovation in one country accelerates clean energy deployment in all countries. And the combined research expertise and market size of the U.S. and China provide an unprecedented opportunity to develop clean energy solutions that will reduce pollution and improve energy security while enhancing economic growth globally . . . As the two largest energy consumers, the U.S. and China have a shared interest in energy efficiency. Energy-saving technologies deployed in one country will reduce energy costs for the other and benefit both economies. n268 The Obama administration's strategic rebalancing to the Asia-Pacific is already providing increased opportunities for interaction and cooperation. President Obama has invited China to join the Trans-Pacific Partnership ("TPP"), a free-trade alliance joining the Americas with Asia. n269 The current parties to the TPP are the United States, Canada, Mexico, Peru, Chile, Australia, New Zealand, Vietnam, Malaysia, Singapore, Brunei, and Japan. Together, this trading bloc makes up forty percent of the global economy. n270 This type of economic diplomacy is promising. Closer military cooperation could also help strengthen the strategic partnership between the United States and China. In May 2013, U.S. National Security Advisor, Tom Donilon met with General Fen Changlong, Vice Chairman of China's Central Military Commission. n271 During their meetings, Donilon and General Fen discussed deepening cooperation between the U.S. and Chinese militaries on several issues like [\*713] peacekeeping, disaster relief, and counter-piracy missions. n272 Admiral Samuel J. Locklear III, the United States Pacific Command Commander, in remarks in November 2014, echoed these sentiments and expressed a clear desire to increase communication, understanding, and closer cooperation between the United States and Chinese militaries. n273 As discussed in Part II above, U.S. Secretary of Defense Leon Panetta invited China to participate in the RIMPAC exercise in 2014. In 2012, twenty-two countries, including Russia, participated. n274 In 2014, twenty-three nations are expected to attend. When asked about China's participation, the Commander of the U.S. Navy's Third Fleet, Vice Admiral Kenneth Floyd noted, "For us, it's an opportunity to build trust and confidence with the partners that we will work with when we're out there. To that extent, having the Chinese participate is very valuable to us." n275 While interaction on the operational level on disaster relief and counter-piracy missions is incredibly useful and important, using the military to engage China on energy innovation presents an unparalleled strategic opportunity. In addition to providing another forum for increased military-to-military contact, it also allows national security concerns, rather than more abstract concepts of climate change or the environment, to drive cooperation and investment in both countries. C. The U.S.-China Military-to-Military Relationship At the height of the Cold War, the Chinese and United States were strategic partners and enjoyed strategic military dialogue, reciprocal exchanges, and arms sales. n276 In response to the Tiananmen Square Crackdown in 1989, the United States suspended military contacts with China. In 1990, the Foreign Relations Authorization Act imposed sanctions on arms sales and other cooperation between the United States and China. n277 This Act did allow waivers that were in the general interests of the [\*714] United States. n278 In response, China cancelled its contract with the United States to upgrade the avionics of the F-8 fighter. n279 In 1992, President George H. W. Bush, cancelled the suspended foreign military sales cases and returned all unused Chinese funds and military equipment. n280 While President Clinton reengaged China, including the military, exchanges with the People's Liberation Army ("PLA") did not regain the closeness reached in the 1980s. n281 Since the 1990s, military contacts have improved and deteriorated along with overall bilateral relations. n282 The National Defense Authorization Act for FY 2000 set parameters for contacts with the PLA. It prohibited the Secretary of Defense from authorizing any mil-to-mil contact with the PLA if that contact would "create a risk to national security due to an inappropriate exposure" of the PLA to twelve delineated areas that include nuclear operations, chemical and biological defense capabilities, military space operations, and arms sales or military related technology transfers, among others. n283 In practice, this law does not prohibit current or future exchanges in any meaningful way. n284 While not directed specifically to China, the Arms Export Control Act governs the transfers of defense articles and services to another country. Section 6 of this Act prohibits sales covered by the Act to any country that is determined by the President to be engaged in a consistent pattern of intimidation or harassment directed against individuals in the United States. n285 Also limiting transfers and purchases, in the National Defense Authorization Act for 2006, Congress prohibited the procurement from any "Communist Chinese military company," of goods and services on the Munitions List, with certain exceptions. Military-to-military relationships remained limited until around 2005, when Admiral William Fallon, Commander of U.S. Pacific Command visited China to advance contacts between all ranks of military personnel and cooperation in responding to natural disasters, reducing overall tensions [\*715] between the two nations. n286 Secretary of Defense Donald Rumsfeld visited China in 2005 and signaled the resumption of the formal military relationship. In 2007, Secretary of Defense Robert Gates said that he did not see China as a "strategic adversary," but as a partner in some respects and a "competitor" in others. n287 In all cases, Secretary Gates stressed the importance of engagement with the PRC "on all facets of our relationship as a way of building mutual confidence." n288 On his visit to China in November 2007, Secretary Gates agreed to open a "hotline" between the PLA and the Pentagon. n289 With President Obama's strategic rebalancing towards the Asia-Pacific region, he stressed the need for increased military contacts to diminish the possibility of disputes with China. The National Defense Authorization Act for FY 2010 expanded the required contents of the Defense Department's report on the Chinese military to include a section on mil-to-mil contacts and a new strategy to increase such interactions. n290 Secretary Gates, in August 2010, told Congress that "sustainable and reliable" military-to-military ties were an important part of the overall U.S.China relationship. n291 Further, he said that he sought to expand practical cooperation in areas where U.S. and Chinese national interests converged and to discuss candidly areas of disagreement. n292 Leon Panetta, who took over as Secretary of Defense after Gates' departure, continued to emphasize the importance of the U.S.-China military partnership. He stated that the mil-to-mil relationship between the United States and China was a critical part of the administration's strategy to shape China's rise in a way that maximized cooperation and mitigated risks. n293 Increasing military-to-military contacts around energy would provide a new avenue for increased dialogue. U.S. and Chinese national interests converge around this issue. This interaction can serve U.S. interests, just like any other military-to-military interaction, which includes conflict avoidance and crisis management, military-civilian coordination, and [\*716] transparency and reciprocity. Conversation between the United States and Chinese militaries on energy will also stoke the fire of the Green Arms Race.

### Solves U.S.-China Coop

#### US-China military energy cooperation prevents miscalculation and facilitates collaboration on operations from anti-piracy patrolling to disaster relief

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

II. CHINA--THE MIDDLE KINGDOM AND ITS RESOURCE QUEST In 2012, Chinese Defense Minister General Liang Guanglie invited United States Defense Secretary Leon Panetta to spend four days in Beijing at the end of September. n126 During the visit, Secretary Panetta met with various members of the Chinese leadership and addressed the People's [\*694] Liberation Army War College. n127 The objective for the visit was to build mutual trust and promote increased military-to-military relations between the United States and China. n128 In the context of the larger and emerging China and United States collaborative partnership, the Chinese Defense Minister noted that new defense relationships could form the foundation for a new type "of military-to-military relationship . . . based on equality, mutual benefit, and cooperation." The General Liang went on to say that, "it is necessary for the two militaries to have more dialogues, communication, to promote understanding--good trust and deepen exchanges and cooperation so as to constantly raise the level of development of this mil-to-mil relationship." n129 In response, Secretary Panetta spoke about the fundamental goal of building a "U.S.-China military-to-military relationship that is healthy, stable, reliable, continuous, and transparent." n130 He highlighted United States and Chinese collaboration during counter-piracy exercises in the Gulf of Aden. To build on this momentum and cooperation, Secretary Panetta invited China to send a ship to participate in the Rim of the Pacific Exercise ("RIMPAC") in 2014. n131 In Secretary Panetta's view, increased interaction with the Chinese military would lower the risk of miscalculation and prevent conflict by increasing cultural understanding and demonstrating United States resolve to ensure free and open seas. n132 Increased defense collaboration with China can add a tremendous and necessary partner to alternative energy innovation. Over the past several years, China has, with interest, studied the United States economy and watched the United States military's efforts to innovate. As the world's most populous country and largest energy consumer, China is pursuing a "by all means necessary" n133 energy strategy to ensure its long-term growth. In September 2013, China overtook the United States as the largest net importer of oil. n134 China's oil consumption [\*695] doubled between 1990 and 2000, and has since doubled again. n135 China is also aggressively pursuing energy alternatives, and it is the global leader in solar technology and is making heavy investments in biofuels. n136 The United States has been watching China's reemergence carefully. China's resource quest is having a global impact in economic, political, and military spheres. Most recently, tensions in the South and East China Seas have risen; China and other regional powers like Japan, the Philippines, and Indonesia are maneuvering to control and secure energy rich territory and sea-lanes. The rebalancing of attention to the Asia-Pacific region comes at precisely the right time. This strategic shift presents a tremendous opportunity for the United States to increase military-to-military interaction with China and mitigate tension in the region. This interaction will help both nations avoid miscalculation and misunderstanding, and facilitate collaboration on operations from anti-piracy patrolling to disaster relief. The next several paragraphs provide historical context and discuss the opportunity to add China as a partner in energy innovation.>

### Solves China Environment / Territorial Conflicts

#### China’s reliance on dirty energy destroys the environment and risks conflict over territorial claims for resources

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

B. China's Global Resource Quest China's resource quest is changing the world's markets for commodities. China's economy is the fastest growing on the planet. n183 As noted above, China is the largest net importer of oil, n184 and its oil imports are growing by fifty percent each year. n185 Chinese state run oil companies have rapidly expanded their global presence by investing in international oil and gas assets in Africa, the Middle East, and Central Asia, through direct acquisitions of equity and development loans in exchange for oil supply. n186 Through this global engagement, China is not only securing diverse sources of liquid fuel, but is also learning and developing its own technical drilling and mining expertise. n187 China is the world's largest power generator, with coal accounting for two-thirds of installed electric capacity. n188 While fossil fuels account for about 80% of China's total power generation capacity, it is expanding its alternative and clean energy usage. n189 China installed 12 gigawatts of solar capacity in 2013, which is 50% more than any country has ever built in a single year. n190 China has a goal to produce at least 15% of its overall energy from renewable energy sources by 2020. n191 The state invested $ 65 billion in 2012 in renewable energy products and plans to spend another $ 473 billion on similar projects by 2015. n192 China is home to the world's largest hydroelectric project, the Three Gorges Dam on the Yangtze River, and is the worlds second-largest wind producer. n193 That all said, even with this incredible growth in alternative energy, China is still adding more fossil [\*701] fuel capability than solar, wind, hydroelectric, and nuclear power combined. n194 China is the largest producer and consumer of coal in the world, accounting for nearly half of global consumption. Western corporations compete in global commodities markets with China's state-owned energy companies that enjoy ultra-cheap loans from the Chinese government. n195 When the China National Petroleum Corporation won a share in a project to pump oil in Kazakhstan, the Chinese President himself travelled to the region to celebrate. n196 Kazakhstan is home to a vast new oil find, the biggest outside the Middle East. n197 When the project started pumping oil in September 2013, it was a clear signal that China's influence in the region was growing, commenters noted, "that China's influence has eclipsed even Russia's across the former Soviet republics of Central Asia." n198 China's energy quest is also having strategic impact on China's immediate neighbors like Japan, the Philippines, and Malaysia. Driven by a desire to secure natural resources, ensure sea lane security and national defense, and grow national pride, China has started to flex its fledgling naval might in the South and East China Seas. n199 Estimates of the petroleum resources in the South and East China Seas vary greatly. The U.S. Geological Survey assesses between 11 billion and 28 billion barrels of oil and approximately 145 trillion cubic feet of natural gas under the South China Sea. Chinese estimates assess between 213 billion and 400 billion barrels of oil (which would make it the largest oil field in the world) and 498 trillion and 700 trillion gallons of natural gas. n200 Estimates of East China Sea oil reserves are similarly speculative, ranging from the U.S. Energy Information Administration's numbers, 60--100 million barrels, and China's 70--160 billion barrels. n201 Even in light of such varied estimates, the interesting conversation revolves around ownership and control. China has laid claim to the entire South China Sea, as did Vietnam, each country excluding only neighboring states' exclusive coastal areas. Of course, these claims overlap with those of the other neighboring nations, including Taiwan, Malaysia, the Philippines, [\*702] and Brunei. In the East China Sea, Japan and China are the two main competitors, each focusing on one set of islands called the Diaoyu in China and the Senkaku in Japan. Both nations claim ownership, the Japanese tracing their stake back to 1895, and the Chinese, referring to documents between envoys, tracing theirs to the Qing Dynasty. n202 Recently, skirmishes have erupted between Japanese and Chinese ships. In 2010, the captain of a Chinese fishing boat crashed his vessel into two Japanese patrol boats near the disputed islands. n203 The Japanese took the Chinese captain into custody and held him for two weeks. n204 In China, the response was severe. Government officials condemned the Japanese actions and suspended all high-level exchanges and threatened "strong countermeasures" when Tokyo refused to release the Chinese mariner. n205 While the Japanese eventually released the Chinese captain, tensions remained high. In 2012, the Japanese government announced that it had purchased the Senkaku islands from their private owner, a Japanese citizen. n206 This infuriated the Chinese, who called the maneuver "the most blatant challenge to China's sovereignty since the end of the second world war." n207 In 2013, Japan accused China of locking military radar "capable of aiding weapon strikes" on a Japanese ship and helicopter in the region, a claim which China denied. n208 Competing resources claims are causing similar incidents in the South China Sea. While tensions in the East China Sea involve two nations and one set of islands, friction in the South China Sea has many more variables. The Sea itself spans 1,4 million square miles, n209 from Singapore and the Malacca Straits to the Strait of Taiwan, from the Vietnamese coast to the Philippines, and South to Indonesia. The oil and gas reserves that lie underneath the seabed hold the promise of economic opportunity for the [\*703] smaller regional nations and local energy security for China. n210 Several Southeast Asian nations, including China, Taiwan, Vietnam, Malaysia, Brunei, and the Philippines, claim title to the South China Sea's largest islands: the Spratly Islands, Paracel Islands, Pratas Islands, Macclesfield Bank, and Scarborough Shoal. n211 In addition to the natural resources under the seabed, the South China Sea is home to fisheries, trade routes, and military bases. n212 Nearly fifty percent of global trade passes through the South China Sea, n213 and its sea lanes are home to three times more tanker traffic than the Suez Canal and five times more than the Panama Canal. n214 Freedom of navigation through this region is tremendously important to the global economy. Competing claims in the region have forced countries to pursue two related paths. First, many countries have turned to international law to resolve conflicts. The United Nations Convention on the Law of the Sea ("UNCLOS") contains extensive rules on the establishment of economic zones in international waters. n215 China has submitted claims to the United Nations ("UN") over the Diaoyu Islands. n216 Japan did the same, referring to the disputed islands, of course, as the Senkaku. n217 The Philippines also brought their dispute with the Chinese over a territory dispute in the South China Sea to a UN arbitration tribunal. n218 Unfortunately, the rules under the UNCLOS are unclear. Often, different parts of the UNCLOS provide justification for the arguments of two separate countries. n219 Further, while the UN commission has the authority to assess "the scientific validity of claims," it does not have the actual authority to resolve disputes. n220 So, the countries often find themselves back where they started, settling the disputes on their own, which leads us to their second course of action. China, informed by its own study of history and international law, established the "9-Dash line" to demarcate its claim to territories and waters in the South China Sea. n221 In 2009, China submitted a map to the UN that [\*704] included the 9-Dash line, as well as included the line on the new version of the Chinese passport. The line caused an immediate row with China's neighboring states. Military activity in the South and East China Seas has increased over the past several years. n222 Vietnam and Malaysia have started building up their military forces, and the Philippines doubled its defense budget and began a five-year series of joint military exercises with the United States. n223 The Chinese Peoples Liberation Army Navy ("PLAN") is aggressively patrolling the region. n224 This militarization of a relatively small sea increases the chances for mishap and misunderstanding, which makes the possibility of finding political solutions more difficult. The Obama administration, recently, has become more involved in these sovereignty disputes. n225 Senior administration officials have challenged China's claims, particularly with respect to the 9-Dash line. n226 In congressional testimony, Danny Russel, Assistant Secretary of State for East Asian and Pacific Affairs noted: Any Chinese claim to maritime rights not based on claimed land features would be inconsistent with international law. China could highlight its respect for international law by clarifying or adjusting its claim to bring it into accordance with international law of the sea . . . Our view is that these actions have raised tensions in the region and have exacerbated concerns about China's long-term strategic objectives. n227 The Obama administration has also preemptively warned China against establishing South China Sea Air Defense Identification Zone ("ADIZ"). n228 Similar warnings did not deter China from establishing an ADIZ in the East China Sea in November 2013. n229 On November 23rd, a Chinese military spokesman announced the creation of a new ADIZ and [\*705] that any aircraft flying through the zone would have to identify itself and follow the orders of Chinese air traffic controllers. n230 While many nations have ADIZs, they typically do not overlap with other countries' territory. n231 China's unilateral actions have strengthened regional bilateral and multilateral alliances among its smaller neighbors; polarization of the region is a real risk. The Obama administration has strengthened ties with the Association of South East Asian Nations ("ASEAN"), which is trying to transform itself into a more integrated and powerful regional force. n232 Singapore and Malaysia have also expressed a desire to increase their security cooperation programs. n233 President Xi's provocative actions certainly appeal domestically to China's nationalist camp. n234 This regional assertiveness may also go hand-in-hand with growing economic power. n235 It also could be a reflection of China's national security calculus. Since the Second World War, the United States has underwritten the secure and free flow of trade across the globe. n236 The United States Navy patrols critical sea lanes and keeps global trade flowing, regardless of the destination of the commodities. n237 However, there is no requirement or guarantee that the United States will keep doing so. If the United States pulls back, China might be left without reliable trade routes and its energy supply may become more volatile. n238 This, of course, has implications for China's economy and its resource quest, and therefore is of critical concern to its national security. A recent Council on Foreign Relations report examined an air war scenario between China and Taiwan and found that fuel could pose "significant restraints" on China and Taiwan. n239 Even though China is the [\*706] fourth-largest petroleum-producing country in the world, the study finds that Taiwan could meet its fuel needs in an air war for five-months--about three times longer than China. This sheds new light on China's quest to secure petroleum, diversify its supply routes, and find new sources of energy. n240 China has been exercising its naval forces in the South and East China Seas. While the PLAN's force projection ability is limited currently, it is innovating. The Pentagon estimates that "by the latter half of the current decade, China will likely be able to project and sustain a modest-sized force, perhaps several battalions of ground forces or a naval flotilla of up to a dozen ships, in low-intensity operations far from China." n241 In fact, the PLAN has been increasing its naval deployments to the Gulf of Aden and is partnering with the United States in counter-piracy efforts there. While the PLAN only appears to be concerned with pirate attacks on Chinese vessels, the deployments are a significant signal of China's intent to increase its presence on the seven seas. As the United States rebalances its attention and resources to the Asia-Pacific region, it will encounter a reemerging China that is less reliant on American power to guarantee its economic future. As the United States increasingly engages with the new China, energy and the environment provide roads that both nations can walk down together.

## Net Benefits

### 1nc Politics Net Benefit

#### Counterplan alone avoids politics

Merchant 10 – environmentalist and freelance writer  
[10/7, Brian, “How the US Military Could Bring Solar Power to Mass Market”, <http://www.treehugger.com/files/2010/10/us-military-solar-power-mass-market.php>, AL]  
Furthermore, Congress is infinitely more likely to approve funding for R&D; and infrastructure if the projects are military-related. Which is depressing, but true -- the one thing that no politician can get caught opposing is the safety of American troops. In fact, the whole premise of the article is rather depressing, on point though it may be: The only way we may end up getting a competitive clean energy industry is through serious military investment, which is of course, serious government spending. Which under any other guise would be vehemently opposed by conservatives.

### --- 2nc Politics Net Benefit

#### CP avoids politics:

#### Military renewables are popular – no politician can get caught opposing safety of troops which shields it from traditional backlash – that’s Merchant – nobody will take on the military

Dayen 10 [David Dayen, “Defense Spending Cuts Face Likely Congressional Override,” Monday May 17, 2010 9:18 am,  
<http://news.firedoglake.com/2010/05/17/defense-spending-cuts-face-likely-congressional-override/>, DMintz]

The lesson of Congress in the modern age is that it’s much harder to eliminate a program than it is to enact one. Every program has a champion somewhere on Capitol Hill, and it probably only needs one to be saved – but 218 and 60 to be put into motion. A case in point: our bloated military budget. The Obama Administration has generally tried to cancel out unnecessary defense programs, with meager success in the last budget year. Congress will probably assert themselves in an election year, however. Defense Secretary Robert M. Gates has vowed to impose fiscal austerity at the Pentagon, but his biggest challenge may be persuading Congress to go along. Lawmakers from both parties are poised to override Gates and fund the C-17 cargo plane and an alternative engine for the F-35 Joint Strike Fighter — two weapons systems the defense secretary has been trying to cut from next year’s budget. They have also made clear they will ignore Gates’s pleas to hold the line on military pay raises and health-care costs, arguing that now is no time to skimp on pay and benefits for troops who have been fighting two drawn-out wars. The competing agendas could lead to a major clash between Congress and the Obama administration this summer. Gates has repeatedly said he will urge President Obama to veto any defense spending bills that include money for the F-35′s extra engine or the C-17, both of which he tried unsuccessfully to eliminate last year. Last year, after a similarly protracted struggle, Gates succeeded in getting Congress to end funding for the F-22, a plane which tended to malfunction in the rain. Seriously. But Congress did not move on the F-35 engine or the C-17, and they seem similarly positioned this year. Ike Skelton and Carl Levin support the F-35 engine, for example, and included it in their appropriation requests out of the House and Senate Armed Services Committees, which they separately chair. I fully recognize that the off-limits discussion about military spending concerns the bases in over 100 countries and continued adventures abroad in places where “victory” means almost nothing. But it’s a symptom of the same problem – the persistent inertia that aids the military-industrial complex to keep the war machine moving. And so we get new engines to planes that don’t need new engines

#### Blame-shifting – the link’s about a decline in Obama’s capital – CP circumvents Congress so Obama doesn’t have to push it

#### The military lobby shuts down criticism

Dunlap 94, Colonel Charles Dunlap, Summer, 1994, Wake Forest Law Review, p. lexis

In addition, the military undermines the fiscal check because it is a particularly effective lobbyist. Like other agencies of government, the armed forces are technically proscribed from lobbying, although they may “communicate” with Congress. Nevertheless, the military services employ a number of imaginative techniques to influence legislation. According to Hedrick Smith, they “unabashedly lobby senators and House members” by flattering them “with courtesies and perquisites” such as domestic and foreign trips. More disturbing, the military often will ensure support by spreading the procurement of expensive weapons systems over scores of congressional districts. Smith also insisted that the “military can turn off the faucet” when displeased with a legislator. Even the most vociferous military critic is subject to pressure when the economic livelihood of constituents is at stake. Armed Forces Journal alleged that Congressman Ron Dellums “was probably right” when the military critic charged that the closing of four military bases in his district was politically motivated. The magazine blame the Pentagon claiming its “temptation to deal poetic justice was likely more than it could resist.”

#### Military is the ideal actor to create technological innovation—it avoids the politics link and spills over into the private sector

Light ’14 Assistant Professor at The University of Pennsylvania (5/20/14, Sarah E., Boston College Law Review, “The Military-Environmental Complex”, <http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3389&context=bclr>)

There are certain unique advantages to military participation in this technological innovation process. First, the mere fact that a project supports military interests—rather than general commercial interests—may drive support among key institutional players who feel more strongly connected to the value of protecting national security than other values such as supporting commerce or protecting the environment. 123 The construction of roads in nineteenth-century America provides an example of how an engineering project with both civilian and military applications obtained congressional funding and presidential support largely because of its alignment with the military’s mission. 124 The original thirteen colonies constructed few roads, except those built by the military and for the Lancaster-Philadelphia Turnpike. 125 As a result, during the War of 1812, the nation faced challenges in moving soldiers and supplies. This difficulty led to a rethinking of the military’s need for roads and a reconsideration of the role the federal—as opposed to state—government should play in financing and constructing them. 126 According to one scholar, “As long as a road could be termed a military road, [President James] Madison and the Congress would approve its construction . . . . When road construction was labeled an internal improvement . . . Madison vetoed the measure even though Congress had passed it.” 127 President James Monroe followed the same path, approving “only those roads which were described as strictly military,” 128 even after Secretary of War John C. Calhoun, in an 1819 report to Congress, wrote:

The role of the military in stimulating technological innovation, as well as in unlocking financing, has thus been exceptional. But on a deeper level, to extrapolate to the clean energy context from the experience of nineteenth- century road building, reliance on the synergy between the military’s interests and energy conservation may provide political cover for those who otherwise might not support investment in clean energy technology solely for civilian purposes or environmental reasons.

Second, the DoD’s exceptional hierarchical nature allows its leadership to consider the importance of changing norms and behavior in ways that might be unthinkable in the private sector. In the military context, behavioral changes are within the realm of possibility in ways that might be hard to fathom in the civilian world. One well-known historical example is the integration of the military long before parts of the civilian world in the United States. For example, President Harry Truman issued Executive Order 9981 on July 26, 1948, formally abolishing segregation in the military even while so-called “Jim Crow” laws were still widely in force in parts of America. 130 By issuing an executive order and exploiting the hierarchical nature of his relationship with the military as Commander-in-Chief, Truman was able to have an impact on behavior and attitudes toward racial integration that, some scholars argue, spilled over into the civilian realm. 131

Though this formal document in no way actually ended segregation overnight, the military acted as a norm-leader in the integration of public life in the United States in ways that arguably had a positive impact on the civilian world. More recent studies have demonstrated that adoption of “green” standards that apply only to government may spill over into the civilian realm even in the absence of mandates on private firms. For example, two researchers found that the U.S. Green Building Council’s Leadership in Energy and Environmental Design (“LEED”) Standard for Green Buildings diffused more rapidly among private developers in municipalities that adopted green procurement policies that applied only to the government than in municipalities without such procurement policies, and that these policies also spilled over into neighboring communities. 132 They concluded that “government purchasing policies can break deadlocks that emerge when coordinated investments are required to adopt a common standard and that adoption stimulates the private-sector market for the goods and services targeted by those policies.” 133

### 1nc Naval Readiness DA

#### NOAA involvement ensures its dominance on ocean policymaking --- restrains the Navy’s freedom of navigation

Kraska, 11 **–** Dr. James Kraska is a Senior Fellow in FPRI's Program on National Security. He serves as Mary Derrickson McCurdy Visiting Research Scholar at Duke University Marine Laboratory, where he focuses on international law of the sea and marine policy and governance.(James, Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics, p. 395-396)

Still, NOAA is the tail-wagging dog of oceans policy in the Department of Commerce, tirelessly working to restrain freedom of navigation as a primary means of protecting the marine environment. Vessel source pollution attracts an inordinate amount of attention within the organization, even though 80% of marine pollution is from land-based, non-point sources, such as agricultural and industrial run-off. At home, the goal is to create and expand a vast system of marine sanctuaries. Abroad, in both bilateral meetings and multilateral forums, the Administration advocates creation of internationally recognized marine protected areas, large marine ecosystems and particularly sensitive sea areas. This single-minded focus, combined with enablers within the Council on Environmental Quality (CEQ) in the White House and allies on Capitol Hill, has emboldened NOAA to conduct an unrelenting campaign of bureaucratic guerilla warfare to promote its regulatory agenda of coastal state control over the EEZ.

NOAA has demonstrated a willingness and ability to leap to the highest levels of the U.S. government to prevail in interagency oceans policy disagreements. Institutionally, NOAA is willing to fight bitterly over the final shape of U.S. positions and comments concerning oceans policy, pulling out all stops to craft the language and tone of even fairly inconsequential resolutions under consideration at multilateral meetings and organizations. Such statements often are of only symbolic significance, but NOAA understands their value in developing precedence and shaping the trajectory of U.S. and international oceans policy.

NOAA punches far above its weight in creating and winning oceans-related controversies within the interagency community of the Executive branch. The past decade has witnessed nearly continuous NOAA advances on domestic restrictions for navigation and overflight throughout the EEZ. The longer-term global effect of broad U.S. claims may be lost on senior officials who are unfamiliar with international law and oceans policy. In surrendering its oceans policy equities to NOAA, the Department of Commerce is unable to promote America's broader oceans interests.

#### Only allowing the Navy to call the shots can sustain freedom of navigation, ensure U.S. global leadership and prevent conflict

Kraska, 11 **–** Dr. James Kraska is a Senior Fellow in FPRI's Program on National Security. He serves as Mary Derrickson McCurdy Visiting Research Scholar at Duke University Marine Laboratory, where he focuses on international law of the sea and marine policy and governance.(James, Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics, p. 411-412)

Only by setting U.S. oceans policy free from its one-dimensional focus on the marine environment can the nation craft a policy that properly balances the competing oceans interests inside the U.S. government. The United States has neglected a frank and public conversation about the costs and benefits of every other oceans equity—national security, economic growth, and scientific research, for example—all taking a back seat to environmental management. Oceans policy should be brought back into alignment with the strategic national vision for advancing greater U.S. interests in military security and economic prosperity.

Attracting international partners to join in the reinvigorated approach is essential and not impossible. Those nations seeking minimum world public order are natural allies in oceans law and policy because they share the goal of maintaining the stability of the global system. Freedom of the seas generally, and freedom of navigation and overflight in the EEZ in particular, have become a litmus test for the support or rejection of American leadership in world affairs. The global political and economic system of the last few centuries rests on the naval supremacy of British and now of American maritime power. "As a vital element of that system, the leading global power . . . " wrote Walter Russell Mead, "maintains the security of world trade over the seas and air," while also ensuring that international economic transactions unfold in an orderly way.89

If the world oceans system can continue to remain stable under the assurance of American power, countries as diverse as Germany, Japan, China, Korea, and India may forgo acquiring the new military capabilities required to ensure access to the world's sea lanes, especially into the Middle East.90 American fleets stretching from the Persian Gulf throughout the Pacific and Atlantic are critical to maintaining world economic and political stability. Ultimately, the U.S. Navy operates to further American national interest, but foreign and domestic interests can converge in a globalized era, and the exercise of America's maritime power generates enormous positive externalities to global security and stability. American naval power is one of the principal public goods of the modern world. On the other hand, however, "The end of America's ability to safeguard the Gulf and the trade routes around it would be enormously damaging, and not just to the United States." suggests Mead.91 If other countries are compelled to maintain fleets in order to protect their supply of energy, defense budgets would dramatically expand in every major center of economic power on the globe.92 In fact this already is happening, as access to the oceans becomes more uncertain for everyone.

"The potential for conflict and chaos is real."93 "Every ship that China builds to protect the increasing numbers of supertankers needed to bring oil from the Middle East to China in years ahead would also be a threat to Japan's oil security, as well as to the oil security of India and Taiwan."94 These warships, moreover, could be misapplied toward adventurism not only across the Taiwan Straits, but also throughout the South China Sea.

Consequently, the Department of Defense should have a veto on formation of all U.S. domestic and international oceans policy. Although the Department of State, or its stand-in, the Coast Guard, may serve as the head of the delegation at the IMO, only the Department of Defense has the national security knowledge to evaluate the strategic impact of maritime concepts and proposals. The Judge Advocate General of the U.S. Navy can fill a dispositive role in the formation of U.S. oceans policy that was abandoned over the previous decades. During the negotiations for the Law of the Sea during the Gerald R. Ford administration, for example, the president provided just such guidance to the delegation. Underscoring the importance of gaining international acceptance to freedom of navigation, unimpeded access through international straits and other high seas freedoms, the president authorized the Chair of the U.S. delegation to exercise judgment and authority in the negotiations "subject to the consent of the senior Department of Defense representatives to the Delegation."95 The Pentagon should recover this veto authority over U.S. oceans policy. In the end, in the present political climate, the only way to solve the lack of strategic perspective in U.S. oceans policy is to place responsibility in a senior uniformed Navy official inside the National Security Council. The three-star admiral serving as the Judge Advocate General of the U.S. Navy, an active duty military officer who is apolitical and who understands the intersection of U.S. national security, oceans policy and international law of the sea, is the best person to fill that role.

### --- 2nc Naval Readiness high now

#### Naval readiness high now—new strategies to integrate training will be fully implemented in 2015

GAO 12 (September 2012, US Government Accountability Office, “MILITARY READINESS: Navy Needs to Assess Risks to Its Strategy to Improve Ship Readiness,” <http://www.gao.gov/assets/650/648682.pdf>)

According to the Surface Force Readiness Manual, readiness is based upon a foundation of solid material condition that supports effective training. In line with this integrated maintenance and training approach, the new strategy tailors the 27-month Fleet Response Plan by adding a fifth phase that is not included in the Fleet Response Plan, the shakedown phase. This phase allows time between the end of the maintenance phase and the beginning of the basic phase to conduct a material assessment of the ship to determine if equipment conditions are able to support training. In addition, the new strategy shifts the cycle’s starting point from the basic phase to the sustainment phase to support the deliberate planning required to satisfactorily execute the maintenance phase and integrate maintenance and training for effective readiness. Under the new strategy, multiple assessments, which previously certified ship readiness all throughout the Fleet Response Plan cycle, will now be consolidated into seven readiness evaluations at designated points within the cycle. Because each evaluation may have several components, one organization will be designated as the lead and will be responsible for coordinating the evaluation with the ship and other assessment teams, thereby minimizing duplication and gaining efficiencies through synchronization. Figure 3 shows the readiness evaluations that occur within each phase of the strategy’s notional 27-month cycle.

As previously noted, development of the Navy’s new strategy began with a pilot program. The pilot was conducted on ships from both the East and West coasts beginning in March 2011. Initial implementation of the new strategy began in March 2012 and is currently staggered, with ships’ schedules being modified to support the strategy’s integration of training, manning, and maintenance efforts.13 Ships that were not involved in the pilot program will begin implementing the strategy when they complete the maintenance phase of the Fleet Response Plan cycle. The Navy plans to fully implement the new strategy in fiscal year 2015 (i.e. to have all surface ships operating under the strategy and resources needed to conduct the strategy’s required tasks in place). While the Surface Force Readiness Manual states that providing a standard, predictable path to readiness is one of the tenets of the Navy’s new strategy, it also acknowledges that circumstances may arise that will require a deviation from the notional 27-month cycle.

### --- 2nc Navy Decision Making Key

#### Only the U.S. navy has the experience and expertise to determine application of ocean policy

Kraska, 11 **–** Dr. James Kraska is a Senior Fellow in FPRI's Program on National Security. He serves as Mary Derrickson McCurdy Visiting Research Scholar at Duke University Marine Laboratory, where he focuses on international law of the sea and marine policy and governance.(James, Oxford University Press, Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics, p.391-392)

Outside of the U.S. Navy and U.S. Coast Guard, there are virtually no U.S. government experts who have experience in the application of the public international law at sea. This national shortcoming is a function of the direction of the discipline of oceans law and policy, which has been heavily influenced by the environmental movement. At many law schools, and consequently in most government legal offices, oceans law and policy is a synonym for marine environmental protection. As late as 1984, then Secretary of the Navy John Lehman could remark that although the Navy has many roles and missions, the historic task of maintaining a free ocean law regime remains dominant." In 1999, the Secretary of the Navy joined with the Secretary of Commerce to declare, "freedom of the seas is integral to the strength and security of our nation."" In the decade that followed, however, this interagency consensus on freedom of navigation unravelled through an unyielding effort by the National Oceanic and Atmospheric Administration within the Department of Commerce and acquiescence by Department of State to implement ever more restrictive marine environmental regulations.

After the invasion of Iraq in 2003, it became extremely difficult to obtain high level attention for any issue in the Pentagon other than Iraq and Afghanistan. From 2003-2009, U.S. freedom of navigation policy joined a legion of other important issues that were sacrificed for lack of oxygen that was consumed by the conflicts in South Asia. In bilateral and multilateral naval and air maneuvers, strategic and operational access to the EEZs of the world is assumed by planners in order to bypass potential diplomatic hang-ups and move into the "rear arena of naval exercises—tactical proficiency with sensors and combat systems. Naval forces spread fairy dust on operational plans that presume unfettered access to the littoral regions—much like fighting a war game with a large number of "notional" (fictitious) warships that really would not be available in an actual fight. Like fiction, war games only depict a model or image of the real world, and therefore require some level of suspension of disbelief. On the other hand, naval forces are admonished to conduct realistic training that simulates actual military operations. The widespread but inaccurate assumption that U.S. naval forces would have unimpeded legal and political access to conduct combat operations in other nation's EEZ is an anachronism.

With the introduction of the Cooperative Strategy for Sea Power in the 21st Century in 2007 by the Navy, Marine Corps, and Coast Guard, there is additional incentive to give a "pass" on excessive maritime claims of other nations. The top leaders of the sea services now place a higher value on securing cooperation with partner nations. As each naval component commander seeks to implement the maritime strategy, the temptation to "regionalize U.S. oceans policy is great. American theater commanders, eager to cement bilateral relationships and possibly unaware of the nuances of the Law of the Sea, may appear willing to make special dispensation for tacit acknowledgement of the excessive claims of partner nations. For many joint commanders, the value of the coastal state as any ally is typically greater than the value of global freedom of navigation policy, especially when making waves with an ally risks disrupting an otherwise solid bilateral relationship. The greatest problem the Department of Defense faces with respect to oceans policy is turning it over to the country desks. The problem of "Country Desk-itis" applies to the country desks within the Directorate of Strategic Plans & Policy, joint Chiefs of Staff, and the Office of the Under Secretary of Defense for Policy, and is discussed below.

#### Navy ocean exploration is critical to sustain military readiness and power projection

Military Analysis Network’98 (“The Oceans and National Security” http://fas.org/man/dod-101/navy/docs/nat\_sec\_316.html)

Tactical Environmental Support

A thorough understanding of the dynamics of the ocean environment is necessary for the success of maritime missions. The Navy’s operational oceanography community is responsible for understanding the effects of the natural environment on the planning and execution of naval operations, and for interpreting atmospheric and ocean phenomena for forces worldwide. This community must respond to new technological opportunities and to new mission needs. The ocean and marine environment affect all aspects of naval warfare. Amphibious, mine, and special warfare forces all require rapid, accurate environmental information to support their basic operations. The ocean’s structure, which varies due to subtle changes in salinity and temperature, determines how sound propagates through water and thus affects the use of sonars; likewise, the environment can be used to find or hide submarines. Similarly, changes in temperature and moisture through the atmosphere affect radars used to detect incoming aircraft or missiles and can create "ducts" where radars cannot detect incoming threats. Today’s high-tech weaponry increasingly requires sophisticated environmental inputs for optimal performance and to support the precision required to engage hostile targets while avoiding collateral damage to civilians persons, property, and other noncombatants.¶ In coastal regions, the dynamics of marine weather and ocean processes are closely intertwined and change rapidly in both space and time. Accurate short-term and long-term modeling of ocean effects can contribute greatly to the success of naval operations. Continued rapid advancements in the modeling field, and especially in the modeling of coastal areas, will continue to maximize the operational capabilities of naval forces.¶ New technology is continually being exploited, including the use and development of new satellite sensors to collect data remotely--especially in regions where access is limited. Microsensor technology is being exploited to create small, often expendable sensors such as drifting buoys and miniaturized weather stations to gather information on microscale features. Relatively small portable sensors are being used on-scene to conduct rapid coastal surveys and measure near-shore underwater obstacles.¶ Despite progress in remote sensing of the environment, vast areas of the world’s coastal zones remain devoid of data. Military commanders will continue to require data with ever greater resolution and accuracy to enhance their margin of safety and optimize their decision making. Additionally, advances in computer technologies are needed to analyze such data and improve predictions of the effects of the environment on naval operations.

### --- 2nc Offshore Energy Development Link

#### Offshore energy development can disrupt military training and readiness

Medina, Smith and Sturgis 14 (January 14, Monica Medina, Joel Smith and Linda Sturgis, Monica Medina previously served as a Special Assistant to the Secretary of Defense and a Principal Deputy Assistant Secretary for Oceans and Atmosphere at the National Oceanic and Atmospheric Administration. Joel Smith is a Research Associate for the Energy, Environment and Security Program at the Center for a New American Security. Commander Linda Sturgis is the United States Coast Guard Senior Military Fellow at the Center for a New American Security Center for a New American Society, “National Coastal Ocean Mapping”, <http://www.cnas.org/sites/default/files/publications-pdf/OceanMapping_MedinaSmithSturgis.pdf>)

Offshore Energy The offshore energy industry is a vital contributor to the nation’s energy needs. Operations in the Gulf of Mexico alone account for 23 percent of total U.S. crude oil production and 7 percent of total U.S. dry natural gas production.15 The migration of sophisticated technology to offshore reserves has accounted for major increases in subsea production and may enable the extraction of additional untapped reserves. Renewable energy has also emerged as a growing offshore industry. 2013 was the first year in which the U.S. government auctioned offshore area leases for wind energy projects.16 Meanwhile, wave energy projects have raised concerns in the maritime community, with offshore development coming into conflict with coastal fisheries management in the Pacific Northwest.17 Other coastal ocean users have expressed concern that new energy projects often require the rerouting of established shipping routes. This type of activity can interfere with efficient transportation of goods, disrupt commercial and recreational fishing grounds and disturb defense readiness through the induction of electromagnetic fields near offshore military training areas.18

### --- 2nc Internal Link / Impact

#### Impact is war and terrorism

Medina, Smith and Sturgis 14 (January 14, Monica Medina, Joel Smith and Linda Sturgis, Monica Medina previously served as a Special Assistant to the Secretary of Defense and a Principal Deputy Assistant Secretary for Oceans and Atmosphere at the National Oceanic and Atmospheric Administration. Joel Smith is a Research Associate for the Energy, Environment and Security Program at the Center for a New American Security. Commander Linda Sturgis is the United States Coast Guard Senior Military Fellow at the Center for a New American Security Center for a New American Society, “National Coastal Ocean Mapping”, <http://www.cnas.org/sites/default/files/publications-pdf/OceanMapping_MedinaSmithSturgis.pdf>)

The United States is a maritime nation with an expansive coastal ocean that is integral to economic, environmental and national security.1 The coastal ocean hosts a wide range of users, including the U.S. military, coastal shipping companies, offshore energy producers, commercial and sport fishermen, recreational users and conservation groups. As a primary user of the coastal ocean, the U.S. military needs dedicated and charted offshore areas in which to train and conduct exercises to prepare for war, thwart terrorist activities and prevent other threats against the United States. For the Navy, Coast Guard and Marine Corps, operating in the coastal ocean is critical to maintaining operational readiness.2 Although the ocean may seem vast, a unified effort is necessary to balance increased offshore activity with the need to maintain U.S. military proficiency and national security and ensure the safety and sustainability of this vital resource. White House Executive Order 13547 adopted the final recommendations of the Interagency Ocean Policy Task Force and established the National Ocean Council to implement an ocean policy to safeguard the country’s ocean interests. The executive order requires the council to work with stakeholders across the country to develop coastal and marine spatial planning.3 To improve transparency and coordination, nine “regional planning bodies” were created to manage the neighboring coastal ocean and produce plans by 2015 for incorporation into the national ocean plan.4 Although significant progress has been made on national ocean planning over the past four years, efforts across the nation to improve information sharing and coordination among ocean users are inconsistent. Meanwhile, increased offshore activity and competition for space in the coastal ocean have created tension among national security, commercial industry and ocean conservation communities.5 As a steward of the ocean, the military expends significant time and resources to comply with federal environmental requirements. However, military users are often challenged by the environmental conservation community because of the potentially harmful effects on ocean life as a result of certain military activities.6 The development of a national coastal ocean mapping system that integrates geospatial data from all coastal ocean users (federal agencies, the military, local and state regulators and law enforcement, industry and private individuals) would be an integral step toward balancing the offshore training needs of the military with the needs of ocean conservation groups and private- sector communities. Such a mapping system would also help integrate federal, military and regional planning efforts to manage these areas more effectively. Ultimately, it would increase transparency and awareness of the burgeoning activity along America’s coasts. The military, in particular, would benefit from a mapping system, which would inform operational planning efforts and help it comply with applicable environmental laws and statutes. The Growing Importance of the Coastal Ocean As the diversity and volume of activity in the coastal ocean increases and numerous users vie for improved access, the potential for conflict rises. In 2010, the Interagency Ocean Policy Task Force recognized that “[d]emands for energy development, shipping, aquaculture, emerging security requirements and other new and existing uses are expected to grow. Overlapping uses and differing views about which activities should occur where can generate conflicts and misunderstandings.”7 Military Activities The ocean functions as a geographic barrier for the United States, as well as a highway for U.S. military forces to deploy around the world. In order to be prepared for national defense, the Navy, Coast Guard and Marine Corps require large areas of the coastal ocean for training and long-range weapons testing. To maximize situational awareness and ensure safety and operational effectiveness, the military places significant value on the collection and analysis of data.8 To operate in the coastal ocean, federal agencies – including the military – must undergo an expansive permitting process to comply with the National Environmental Protection Act. The law requires federal agencies to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health of its programs, policies, and activities.”9 Military users must also comply with a host of other marine-based environmental protection laws, such as the Endangered Species Act, the Marine Mammal Protection Act, the Coastal Zone Management Act and the Clean Water Act, as well as state environmental protection laws. To plan and chart operation areas for defense exercises in the coastal ocean, the military is required to craft detailed environmental impact statements indicating compliance with existing federal regulatory statutes. The process to obtain the necessary permits is arduous and requires significant time and resources. For example, the Navy has spent nearly five years attempting to obtain the necessary permits for a training exercise that begins in January 2014. Because the permits expire after five years, the Navy will need to start the permitting process over again once the exercise is over to secure mission-critical offshore training space.10

#### Flexible use of ocean key to military readiness that deters conflict

Military Analysis Network’98 (“The Oceans and National Security” http://fas.org/man/dod-101/navy/docs/nat\_sec\_316.html)

The role of naval power in U.S. military strategy is in transition. With the end of the Cold War, the United States is much less likely to face the prospects of a world war. However, uncertainty remains over when, where, and how future conflicts involving U.S. armed forces will occur. Draw-downs in the size of U.S. forces maintained, and a more diffuse and complex political environment, have put a premium on flexible forces that can quickly move anywhere and remain there for a long time. These forces must function without undue logistic strain to respond to threats to international peace or security. There is also a premium on flexible forces that are capable of multiple missions. Maritime forces have inherent strengths which make them America’s best tool to effectively meet most emergent and changing military situations.

Through the use of the world’s oceans by U.S. forces, the advantage of on-scene capabilities for simultaneously executing all three components of the National Military Strategy is possible without infringing on any nation’s sovereignty. According to the Chief of Naval Operations: "The Navy contribution to our national security objectivess defined by the major components of the National Military Strategy: peacetime engagement, deterrence and conflict prevention, and controlling crises."4 This role is rooted in the fundamental ability of the Navy-Marine Corps-Coast Guard Team to maneuver independently of the control of other nations and win. This is done through an ability to operate in international waters with forward deployed forces in the highest possible state of readiness.

Modern military systems allow the United States to hold potential adversaries at risk at ever greater distances. As technologies shrink the globe, the United States is effectively closer to potential enemies who also have long-distance military capabilities. To counter these capabilities, U.S. forces must be prepared to use the oceans to meet potential adversaries on their home ground or on waters far from U.S. coasts. In this very important way, the oceans can buffer North America from conflict overseas. Key to the ability to provide trained, ready forces anywhere in the world at any time to meet our national security objectives is freedom of navigation. U.S. public vessels provide a forward U.S. presence to protect our own and allied interests. Freedom of the seas also ensures that commercial and military cargoes can move freely by sea. The U.S. has a special interest in maintaining secure, stable lines of communication at sea throughout the world. As the 21st century approaches, the United States can look back at fifty years of relative peace on the high seas. Maintaining this combination of security and navigational freedom of the seas is a fundamental condition for global peace, security, and prosperity.

Overflight Freedom

Freedom of navigation applies not just to the oceans but to the airways above, and ensures that aircraft are free to move passengers and cargo over the oceans to their destinations. Freedom of overflight, like freedom of navigation, permits military forces to respond in times of crisis and is essential to free trade. No one can legally deny anyone the right to fly over the oceans in international airspace, and no landing rights are required for military flight operations at sea. The fact that aircraft operating independently or in conjunction with warships may operate up to 12 nautical miles from any littoral (coastal) state eases access ashore.

Both maritime and airborne freedom of navigation require assured safe passage, free from the threat of harm. Both require provisions for safety, rescue, and navigational assistance. Freedom of overflight above the oceans is as important as the freedom of maritime navigation, in both commercial and military terms.

Power Projection

The oceans provide access to littoral states. Military presence on the high seas provides the United States with the capability to project power to areas of international tensions, to help friends and allies, and to preserve international peace and stability. A range of options is thereby available to U.S. foreign policy makers. Military power may be projected symbolically as a diplomatic goodwill gesture or to deter war.

Mobility, endurance, lift, and response are the components of global projection of military power over the oceans. Sealift and airlift can transport land forces and materiel across the oceans to most trouble spots worldwide. Naval forces have the unique ability to remain at their stations for months, ensuring continued presence on the oceans wherever trouble may arise.

Deterrence

Naval forces are among the most useful of diplomatic tools. Policy makers can send them to over two-thirds of the world’s surface at any time without having to obtain advance basing rights or prior permission to conduct naval movements. Having a sound capability for deploying military forces to almost any coastal (littoral) area makes it possible for the United States to provide the tangible leadership that is necessary to facilitate the assembly of coalition forces, or negotiate forward basing rights should the circumstances so require.

While U.S. maritime forces may not be immediately visible offshore, they are a potent deterrent to potential adversaries since such forces can arrive quickly and remain indefinitely. Routine forward deployment provides the President of the United States with "on-call military presence" almost anywhere in the world and furnishes the capability to project military power and show credible resolve without provoking war. This presence also reminds potential adversaries of U.S. military capability and resolve to enforce international law. In this regard, the oceans and U.S. naval forces provide the United States with unparalleled peacemaking capability and promote the rule of law.

## Answers to Answers

### AT: Permutation --- Do the Counterplan

#### The permutation severs --- even “non-combat” roles are still considered military

Brown 12 – Sylvia Brown, DPhil from the University of London, “Youths in Non-Military Roles in an Armed Opposition Group on the Burmese-Thai Border”, Thesis submitted for the degree of Doctor of Philosophy in the

Department of Development Studies, School of Oriental and

African Studies, University of London, http://eprints.soas.ac.uk/15634/1/Brown\_3434.pdf

a) Definition of key terms

The term ‘youth’ is understood in this study to be a socially constructed emic term which, like all social constructions, is not static, but continually re-defined by society based on the social context of the time. The term ‘non-military’ is used here to refer to roles which are not located within army or militia structures. Since roles within military structures involve both combat and non-combat roles (army cooks, porters, signallers and engineers, for example), the term ‘non-combat’ can be used to refer to ancillary roles within a military, which are not the focus of this study. This study is concerned with participants outside the armed wing of an armed opposition group entirely, for instance, within its administrative apparatus or mass organisations.

#### The coast guard is part of the military

USCG ’14 (3/20/24, The United States Coast Guard, “About Us”, <http://www.uscg.mil/top/about/>)

The U.S. Coast Guard is one of the five armed forces of the United States and the only military organization within the Department of Homeland Security. Since 1790 the Coast Guard has safeguarded our Nation's maritime interests and environment around the world. The Coast Guard is an adaptable, responsive military force of maritime professionals whose broad legal authorities, capable assets, geographic diversity and expansive partnerships provide a persistent presence along our rivers, in the ports, littoral regions and on the high seas. Coast Guard presence and impact is local, regional, national and international. These attributes make the Coast Guard a unique instrument of maritime safety, security and environmental stewardship.

### --- XT: Non-Military Can’t Include Military

#### “Non-military” is an absolute prohibition on military use --- their interpretation wouldn’t only make sense if the topic read “non-aggressive”, which unlimits

Benkèo 85 – Dr. Marietta Benkèo, Professor of Astronomical Space Research at Utrecht University Observatory, et al., Space Law in the United Nations, p. 176

4.3.1.1 The Terms 'Peaceful', 'Non-Military' and 'Non-Aggressive'

The vast literature on the subject shows, in space law, two major interpretations of' peaceful': that of non-military and that of non-aggressive53. In international law ‘non-military’ is defined as the prohibition to use outer space for military activities in times of peace, whereas 'non-aggressiveness' refers to the permission to use at least partial military precautions. The term 'non-aggressiveness' includes the possibility to apply military activities in outer space law-fullyas long as those activities do not aim at direct attack in the sense of the United Nations definition of 'aggression'.

The concept of non-aggressiveness is, from the political point of view, therefore a much broader one than the non-military one: it permits among other things almost all present activities in outer space such as those of 'spy' satellites, interceptor satellites, remote sensing satellites of a certain type as well as laser beam experiments and the use of nuclear power in outer space. At this point it begins to be difficult for those among us who are in favour of peace on Earth as well as in the rest of outer space, because many outer space activities, scientific or not, have up to now been executed by military personnel\*; so that, if we had to get rid of the 'non-military', this would mean that space research as it stands would become impossible. But it would be difficult, if not impossible, to discontinue space research, the more so since international law, and, to a smaller degree space law, do not forbid the use of outer space for military purposes.

#### “Non-military” means only civilian activity---even peacetime activity of military forces is excluded

Bunyan 6 – Tony Bunyan, Director and Editor of Statewatch, “Essays for an Open Europe”, http://www.statewatch.org/secret/essays2.htm

There are a few other aspects to the Solana decision which are worrisome. First, the phrase "non-military crisis management" refers to civilian aspects of crisis management, such as police and judicial co-operation. This would exclude, for example, access to all documents relating to the new EU rapid-reaction paramilitary police force, even with regard to policy-making matters. Second, the Solana decision allows international organisations such as NATO and third countries such as the US to veto a citizens access to documents if the documents have been drawn up by or in conjunction with them. For all the rhetoric of the EU on the need for greater transparency only the Netherlands, Sweden, and Finland voted against adoption of the Council's Solana decision.

#### ( ) Nonmilitary actions cannot involve the military

The Free Online Dictionary ‘4 (1/20/4, The Free Online Dictionary, “nonmilitary”, http://www.thefreedictionary.com/nonmilitary)

nonmilitary -not associated with soldiers or the military; "unmilitary circles of government"; "fatigue duty involves nonmilitarylabor"

#### ( ) Nonmilitary actions cannot involve the military

Oxford Dictionary ’13 (10/26/13, Oxford Dictionaries, “nonmilitary”, http://www.oxforddictionaries.com/us/definition/american\_english/nonmilitary )

nonmilitary

ADJECTIVE

Not belonging to, characteristic of, or involving the armed forces; civilian :the widespread destruction of nonmilitary targets

# Affirmative Answers

### Evidence for Permutation “Do the Counterplan”

#### Military assets can be used for “non-military” exploration/development

Gvosdev ‘10

Nikolas K. Gvosdev is a professor of national security studies at the U.S. Naval War College. He is currently a senior editor at The National Interest. – internally quoting Derek Reveron, who is a professor of national security affairs at the U.S. Naval War College – “The Defense Exports” – The National Interest – October 10, 2010 – <http://nationalinterest.org/commentary/the-defense-exports-4201>

Derek Reveron’s concept of “exporting security” (discussed in detail in a book of the same name just released by Georgetown University Press) could provide a way forward out of this impasse. Although the public’s attention is drawn to the ongoing conflicts in Iraq and Afghanistan, much of what the U.S. military is doing today is strengthening the capacities of partners—strengthening their abilities to exercise effective control over their territories and coastlines and to be in a position to repel outside threats. The United States has security-assistance programs with 149 other nations. Some of it is active, kinetic support in combating insurgents, terrorist groups or drug cartels, as in Yemen and Colombia. Some of it is developing partnership and training programs to enhance the ability of nations to deploy peacekeeping forces or coast guards. It can encompass the gamut from humanitarian relief operations to creating defensive alliances. The net result of all of these efforts is to “develop enduring relations” with other states that gives the United States access to a global network of bases and platforms, but also “strengthens key partners and reduces both the need for American presence and the negative attention it sometimes generates”—and in so doing, can also reduce the burden on the United States to have to act as a global sheriff. Reveron’s approach avoids the “stocking up” approach to military procurement, because the emphasis would be on finding ways to deploy and use assets, rather than warehousing systems “in case of emergency.” For instance, in the maritime realm, the carriers, amphibious vessels and destroyers that were designed to contain the Soviet navy and protect sea lines of communication (and which might be used in a similar role vis-à-vis China in the future) are now being used “to conduct activities ashore to improve human security.” The 2010 response to the Haiti earthquake saw an aircraft carrier and sixteen other warships deployed to provide humanitarian relief and rescue services; such “nonmilitary” missions, in turn, help to reduce the factors which can produce security threats to the United States and reinforce American ties with other states. Reveron quotes a navy official who notes that using “war” assets for non-military missions such as training and humanitarian relief means “We can show up, provide training, provide resources, and then leave very little footprint behind.” An “exporting security” approach guides future procurement decisions towards “multiuse” platforms that can combine conventional and non-conventional missions.

#### Military Assets aren’t a bright line – they’re often deployed in non-military missions.

Perry ‘8

(et al; Dr. Charles M. Perry – Vice President & Director of Studies, Institute for Foreign Policy Analysis

The U.S. Foreign Disaster Response Process: How It Works and How It Could Work Better

Charles M. Perry – May – http://www.ifpa.org/pdf/DisasterRelief.pdf.)

Traditionally, if it is determined that military assets are indeed necessary to respond to a disaster, OFDA will submit a formal request for military assistance to the State Department’s Executive Secretariat, which will in turn forward the request to the Executive Secretariat of DoD. Following an intensive intra-DoD review process, the secretary of defense or deputy secretary may order the deployment of military assets to the disaster zone in support of OFDA efforts, signing what is called a “third party waiver” to allow U.S. military goods and services to be used in a non-military operation to assist a “third party.” On the basis of such a waiver, over fifteen thousand U.S. soldiers and sailors were deployed as part of the 2004 tsunami response to work alongside OFDA in the affected regions. More specifically, the U.S. military provided twenty-six ships, eighty-two planes, and fifty-one helicopters to help deliver more than 24.5 million tons of relief supplies and enable USAID and other disaster relief agencies to move much-needed aid to inaccessible areas affected by the tsunami (OFDA 2005, 17). But DoD assistance may be as limited (if nonetheless crucial) as the dispatch of a single C-130 to deliver supplies to a disaster zone, or the diversion of a nearby ship to assist in the evacuation of people at risk or injured. In theory, the criterion for both levels of response is that no commercial alternative exists or is readily available. However, despite the formal process for requesting military assistance, local U.S. ambassadors and country officers in the relevant regional bureau at the State Department have often requested DoD assistance directly, leaving USAID and OFDA out of the loop. Moreover, some officials at State are neither familiar with disaster management issues and procedures nor even aware of USAID’s and OFDA’s role as the LFA for foreign HA/DR activities. For instance, in response to flash floods in the Horn of Africa in 2006, State issued a request for DoD assistance. When personnel from DoD spoke with the relevant regional bureau at State, they found that staff at the bureau were unaware of OFDA’s role or that USAID was in fact the LFA, and needed to provide the justification for DoD assistance. Still worse, DoD actually had to give bureau officials the contact information for the proper USAID/OFDA representatives (interview 2007a). Examples such as this illustrate the conundrum facing DoD: How does the military (meant primarily as a resource of last resort) respond to requests for assistance when State Department officials may not yet have properly coordinated with USAID/OFDA to fully assess the availability of civilian options, including cheaper, commercial alternatives? In an effort to avoid such situations in the future, USAID, DoD, and State’s Bureau of Political-Military Affairs (State/PM) are drafting new HA/DR guidelines to clarify how State should respond to and handle overseas disasters, and to improve the State-DoD assistance request process. OFDA, of course, is generally quite willing to request the mobilization of military assets for overseas relief missions, and to give DoD relatively wide latitude to work directly with its counterpart in the affected nation. This is especially true when that nation lies within a region of strategic interest, as was the case during the 2004 Indian Ocean tsunami, the 2005 Pakistan earthquake, the 2006 Philippine mudslide, and the 2007 Bangladesh cyclone. That said, increased calls for DoD involvement in HA/DR missions have pushed the military to operate less as an instrument of last resort in support of civilian relief agencies and more as a regular contributor, intimately involved in a broad range of humanitarian work. Increasingly, U.S. forces are on the ground, working alongside host nation officials and military personnel to eliminate sources of instability and improve livelihoods through various development and capacity-building projects. In the Horn of Africa, for example, U.S. Central Command (CENTCOM) established the Combined Joint Task Force-Horn of Africa (CJTF-HOA) in 2002 to promote regional stability and protect coalition interests through disaster relief, humanitarian support, medical and dental assistance, and construction and water development projects. CJTF-HOA also provides military-to-military training in counterterrorism and in border and maritime security. In 2008, the U.S. government will establish a new unified combatant command responsible for Africa known as Africa Command (or AFRICOM) to expand CJTF-HOA civil affairs efforts and similar projects elsewhere on the continent. For their part, U.S. Southern Command (SOUTHCOM) and PACOM already run similar programs in their respective areas of responsibility (or AORs), such as Joint Task Force-Bravo (JTF-Bravo) in Central America and Joint Special Operations Task Force-Philippines (JSOTF-P).

(Note: The acronym “OFDA” stands for the US’s “Office of Foreign Disaster Assistance”. “HADR” stands for “Humanitarian Assistance and Disaster Relief”)

#### Navies can and do carry out “non-military operations”

Sakhuja ‘11

Dr Vijay Sakhuja is Director (Research), Indian Council of World Affairs (ICWA), New Delhi. He is also Visiting Senior Research Fellow at the Institute of Southeast Asian Studies (ISEAS), Singapore since 2006. He is a former Indian Navy officer. Dr Sakhuja received his Ph D from the Jawaharlal Nehru University in New Delhi. – Asian Maritime Power in the 21st Century: Strategic Transactions China, India and Southeast Asia. p. 199

Since the 1990s, India has been nurturing an ascendant operation maritime profile. It has established bilateral engagements with the United States, Russia, France, the United Kingdom, Israel, Japan and several countries in the Southeast Asian region. Codenamed Malabar, the Indo-U.S. naval exercises were conceptualized in 1992 to mark the beginning of a new relationship between India and the United States," and fourteen such naval exercises have taken place in the past. In the beginning these exercises were rudimentary and these have progressively improved in content and complexity with participation by several complex platforms such as aircraft carriers, nuclear submarines and long-range maritime patrol aircraft." The exercises paved the way for greater understanding between the naval forces and helped to develop a broad framework for operating together in support of non-military operations such as anti-piracy, safety of sea lanes, and antidrug and gunrunning patrols. The 1998 Indian nuclear tests abruptly ended cooperation between the two navies, but bilateral exercises were resumed and the cooperation got a boost with the Indian Navy dispatching a naval helicopter to USS Hewitt to carry out the medical evacuation of a U.S. navy sailor.

### Evidence for Permutation “Do Both”

#### The DOD can coordinate with other agencies

Light ’14 Assistant Professor at The University of Pennsylvania (5/20/14, Sarah E., Boston College Law Review, “The Military-Environmental Complex”, <http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3389&context=bclr>)

The DoD has committed to working in concert with other federal agencies to promote the development of new technologies to reduce energy demand and intensity, to make use of military lands for large-scale renewable energy projects, and otherwise to promote national energy security. Most important in this regard, the DoD has entered into three Memoranda of Understanding (“MOUs”) with other agencies: the Department of Energy (“DOE”),209 the Department of the Interior (“DOI”),210 and the Environmental Protection Agency (EPA).211

The MOU with the DOE aims to strengthen coordination efforts in areas such as “energy efficiency, renewable energy, water efficiency, fossil fuels, alternative fuels, efficient transportation technologies and fueling infrastructure, grid security, smart grid, storage, waste-to-energy, basic science research, mobile/deployable power, small modular reactor nuclear energy, and related areas.” 212 This includes using military installations as a “test bed to demonstrate and create a market for innovative energy efficiency and renewable energy technologies coming out of DOE laboratories” and other sources. 213 The partnership permits the DOE to hasten the development of new technologies through the DoD’s pilot testing, collaboration, and deployment of these technologies. 214 In recognizing the importance of energy security, the MOU expressly relies on the Military-Environmental Complex, noting that energy efficiency can “serve as a force multiplier, increasing the range and endurance of forces in the field while reducing the number of combat forces diverted to protect energy supply lines . . . . Solving military challenges through innovation has the potential to yield spin-off technologies that benefit the civilian community as well.” 215

The MOU with the DOI provides that the two agencies will cooperate to “facilitate appropriate, mission-compatible renewable energy development on public lands withdrawn for defense-related purposes . . . and other onshore and offshore areas near or adjacent to DoD military installations.” 216 In particular, the DoD has committed to work with the Bureau of Land Management to develop a pilot project for authorizing solar projects on military installations in California and Arizona, 217 as well as other types of renewable energy projects harnessing solar, wind, geothermal, and biomass energy. 218 The MOU parties recognize that a contract with the military could “mitigate some financial risk to a project by providing a significant customer whose energy needs are predictable and consistent.” 219 Finally, the DoD’s MOU with the EPA focuses on using the DoD’s installations as “test beds for innovative technologies and approaches” to support the development of sustainable infrastructure. 220

#### Perm solves: partnership with nonmilitary departments key to making alternative energies cost effective

Velandy 14 --- Major in US Marine Corps Reserve (June 8 2014, Siddhartha M Velandy, Vermont Journal of Environmental Law, “The Energy Pivot: How Military-Led Energy Innovation Can Change the World” <http://vjel.vermontlaw.edu/publications/energy-pivot-military-led-energy-innovation-can-change-world/>)

In addition to pure technological innovation, the Department of the Navy is pursuing novel research and funding mechanisms to reorient the bureaucracy towards energy innovation. The Farm-to-Fleet Program unites the experience and interests of the Departments of Energy, Agriculture, and the Navy in partnership with the private sector to accelerate the development of a domestic market for advanced biofuels that are cost-competitive [\*686] with traditional fuels. n77 The departments pledged to invest a combined $ 510 million on a one-to-one cost sharing basis with private partners, to build multiple, geographically dispersed, commercial scale refineries. n78 Through this program, the military will not be forced to pay a premium for biofuel. n79 Using authority in Title III of the Defense Production Act, which supports industrialization of defense-critical domestic industries, the Department of Defense announced an award to three private companies to build capacity to produce 150 million gallons of drop-in military compatible biofuels each year at an average cost of less than $ 4 per gallon--a price competitive with conventional fuels. n80 The Navy committed not to pay for operational quantities of biofuel until it was cost-competitive with traditional fuel sources. n81 With creative programs like Farm-to-Fleet, the Navy now expects to be able to buy operational quantities of biofuel at competitive prices by 2016. n82

### Can’t Solve Environment

#### The Navy has a bad track record with ocean protection, recent lawsuit creates negative perception

Foley 14 (Jan 28, 2014, James A Foley, Nature World News, “US Navy Sued for Violating Marine Mammal Protection Act in Connection with Sonar Training Exercises”, <http://www.natureworldnews.com/articles/5803/20140128/navy-sued-violating-marine-mammal-protection-act-connection-sonar-training.htm>)

A lawsuit filed Monday accuses the US Navy and the National Marine Fisheries Services of violating the Marine Mammal Protection act by their role in allowing a series of planned underwater activities including open-sea bombing drills and sonar activities that, by the Navy's own account, will affect millions of marine mammals. Dolphins, whales and other marine mammals that depend on sonar and echolocation to find food and navigate, will be in the crosshairs of a five-year naval exercise in the waters between Southern California and Hawaii. The lawsuit, which was filed by the influential non-profit group National Resources Defense Council (NRDC) and several conservation organizations, says that the federal government, via the National Marine Fisheries Services, illegally granted the Navy permission to harm marine mammals during its ongoing underwater sonar and explosives training activities, which are scheduled to take place until 2018. Compared to similar activities done in the previous five years, the Navy plans to increase its sonar training activities by 1,100 percent between now and 2018, the NRDC reported, citing a National Marine Fisheries Services ruling allowing the increase activity. Michael Jasny, the director of the NRDC marine mammal protection project, said the Navy's activities over the next five years will not be sustainable and will harm marine mammals approximately 9.6 million times. "The science proving the link between sonar exposure and population decline is mounting. And so are the solutions that could prevent thousands of needless injuries and hundreds of deaths," Jasny said in a statement. "There are more than 35 species of whales and dolphins that make Southern California and Hawaiian waters their home, including endangered blue whales, fin whales and hearing-sensitive beaked whales. All are at risk from this preventable harm." In August of 2013, the Navy's own environmental impact surveys reported that millions of animals would be affected by its underwater sonar training, underwater detonations, and gunnery exercises. While it only projected 155 marine mammal moralities for its operations off the coast of Hawaii and Southern California, the Navy estimated 2,000 marine mammals would suffer permanent hearing loss or other permanent injury and millions of marine mammals with temporary hearing loss. "The Navy's analysis indicates that while large numbers of marine mammals may be affected by sonar and explosives activities, over 99.9 percent of the animals affected will experience only temporary behavioral effects that do not result in injury," Rear Adm. Kevin Slates, the energy and environmental readiness division director for the Navy, said in a statement made in August. At the time, Slate said that live training exercises were necessary to prepare for real-life situations. "The Navy will operate its most powerful sonar systems for nearly 60,000 hours over the next five years, more than triple the number of hours it was authorized to use these systems in the last five years," the lawsuit against the Navy states. "There is no dispute that the Navy's use of mid-frequency sonar can kill, injure, and disturb marine mammals. Both the Service and the Navy acknowledge that the use of mid-frequency sonar during Navy exercises has contributed to mass strandings of whales and other marine mammals. During the next five years, the Navy will also detonate more tha 250,000 explosives. At least 7,000 of these detonations will be more powerful than the charge that killed at least three dolphins during a Navy training exercise in southern California in 2011." Blue whales and beaked whale will fall victim to the training exercises. Beaked whales are a deep-diving species that are not well understood by science, and blue whales can grow to be the largest living creatures on Earth. The death of up to 10 beaked whales and as many as 13 blue whales is authorized for the Navy's five-year operation. "This is an unprecedented level of harm," Zak Smith, an attorney with the NRDC, told the Los Angeles Times. "In order to authorize these impacts on marine mammals, the service had to turn its back on the best available science." The lawsuit states that blue whale populations have not increased off the western North America coast in the last two decades and that the military exercises "may pose significant risks to the recovery rates of endangered blue whale populations." "The sonar will also threaten the western gray whale, one of the most endangered whales in the world," said Doug Norlen of Pacific Environment, a California-based non-profit and plaintiff in the case against the federal government. "With a population of only about 150 individuals, including 30 females of calving age, any injuries or deaths would be devastating. Surely the Navy can find a way to protect our seas without killing its wildlife." The lawsuit challenges the National Marine Fisheries Services' authorization of "takes" during the naval operation, as well as the supposition that the Navy's activities will not jeopardize the recovery of the blue whale. It asks that the the authorization to voided and that the Navy be forced to comply state and federal environmental laws and that the training be restricted to certain times and locations.

#### Military has a poor track record with the environment in the Asia-Pacific region

PR 14 (January 16 2014, Press Release, Asian Journal, “US troops have extensive track record of environmental pollution and destruction across the Asia-Pacific Region” <http://asianjournal.com/news/us-troops-have-extensive-track-record-of-environmental-pollution-and-destruction-across-the-asia-pacific-region/#sthash.xnj1OzT7.dpuf>)

The grounding of the US Navy minesweeper USS Guardian on the Tubbataha Reef Natural Park a year ago, which resulted in the destruction of 2,435 hectares of vital coral reefs, is just the tip of the iceberg. This was the conclusion of an assessment of the environmental track record of US military forces in the Philippines and across the Asia-Pacific region by the Kalikasan People’s Network for the Environment (Kalikasan PNE), which was released in time for the first-year anniversary of the environmental disaster in the ecologically-critical world heritage site. “Aside from issues of sovereignty and territorial integrity, the Tubbataha Reef grounding, Oyster Bay naval base construction and other recent controversies in which the US Navy and military forces figured have brought to public attention the environmental impacts that increased presence and activity of US forces can bring,” said Leon Dulce, campaign coordinator of Kalikasan PNE. The assessment also detailed the following adverse ecological impacts incurred by US troops in PH and across the Asia-Pacific region: Recent and long-standing incidences of toxic and hazardous waste dumping in the former US bases, the most recent of which was the dumping of four (4) million liters of bilge water and sewage in Subic Bay last October 2012; · The ongoing construction of a US-South Korean naval base over Jeju Island, a historically and culturally important island that is a UNESCO biosphere reserve and home to different world heritage sites; · The use of different islands in the Pacific Island region for weapons testing, including nuclear devices, and the dumping of various toxic wastes, such as in Wake Island, Saipan, Johnston Atoll, and Guam; · The recent jettisoning of 4 bombs, two inert and two unarmed, onto Australia’s Great Barrier Reef during a training exercise by US Navy planes last July 2013; · The long-standing track records on toxic waste dumping in US bases in Japan, and the threat of an airbase relocation to a reef site that is a known habitat of the rare Dugong species. People’s Responses: ban the bases, US troops out Zeroing in onto the PH experience, the assessment noted the different stakeholders’ responses to current environmental impacts. Responses from both the US and PH governments were clearly lacking, as exhibited in the non-payment of compensation for the various affected environments as in Tubbataha Reef and Subic Bay, among others. “On the other hand, various environmental groups and social movements have intensified opposition to US rebasing in PH and the Asia-Pacific. Legal actions such as the “’Writ of Kalikasan’ petition were filed against US troops and their military operations, while various unities against US bases were discussed at length and forged through the International Conference on US Bases in July last year,” Dulce said. A people’s unity statement was also circulated last year opposing the rebasing and other onerous military agreements of US, immediate compensation for the environmental destruction and toxics impacts they caused, and the achievement of peace and security in the region’s seas through peaceful, diplomatic means. “The Aquino government, which has defended the VFA and the de facto rebasing, must address the growing national and global public concern over the environmental implications of US troops presence in the country and region. The people’s right to a balanced and healthful ecology, after all, is also a national interest,” Dulce ended. - See more at: http://asianjournal.com/news/us-troops-have-extensive-track-record-of-environmental-pollution-and-destruction-across-the-asia-pacific-region/#sthash.BQPoaOxZ.dpuf

#### The military is not legally obligated to protect the environment

Light ’14 Assistant Professor at The University of Pennsylvania (5/20/14, Sarah E., Boston College Law Review, “The Military-Environmental Complex”, <http://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=3389&context=bclr>)

The military and its mission to “provide the military forces needed to deter war and protect the security of our country”6 are often perceived to be entangled with the military-environmental complex, and thus, inherently at odds with environmental protection.7 Legal doctrine reinforces this view. The military is largely exempt from environmental laws and regulations covering such broad areas as habitat conservation and information disclosure rules concerning toxic chemicals—at least when those laws conflict with the military’s mission to protect national security.8

#### The Navy won’t try to fix the environment—statements show

Revere et. al, ‘2 (2/1/2, Jessica Vallette Revere, Brock Evans, Ed Lytwak, “Navy Claims Environmental Laws

Are Threat To National Security”, <http://www.lfas.net/navyclaimsecolawsarethreat.htm>)

Washington, DC - Citing growing restrictions on its operations, weapons development and training, the U.S. Navy will soon seek Congressional exemption from compliance with several environmental laws, according to agency documents released today by Public Employees for Environmental Responsibility (PEER). "The Navy's environmental philosophy is 'damn the torpedoes, full speed ahead,'" commented PEER General Counsel Dan Meyer, a former Navy officer. "The Navy's senior command does not appreciate that defense of the nation does not demand despoliation of our natural resources." In recent briefings and position papers, Navy officials contend "the cumulative impact of compliance [with applicable environmental laws] can have severe to extreme consequences on operational readiness." Present and future limitations on firing live explosives, night training, operations in marine sanctuaries and emerging weapon systems, such as its new "LFAS" (Low Frequency Active Sonar) present potential obstacles to the Navy's mission.

The Navy decries actions to protect threatened and endangered species by federal wildlife protection agencies such as the U.S. Fish & Wildlife Service and the National Marine Fisheries Service because they take a "precautionary approach" toward protecting sea life, arguing that its operations should not be hampered by "lack of quality data" and "limited scientific understanding" of the vulnerability of marine mammals, sea turtles and other aquatic life.

Despite recommendations that Navy contractors "consider, wherever practical, using closed environments (e.g. quarries, catch-ponds) for the testing of ordnance and other live-fire testing" the Navy resists adopting any possible changes in its own operations to avoid environmental impacts. >Instead the documents outline a series of statutory exemptions that the Navy intends to seek from the Endangered Species Act. "We cannot simply stand by while the military or anyone else attempts to cut and shred the fabric of our nation's environmental laws, especially one that was so painstakingly crafted by past generations," said Brock Evans, a former marine and executive director of the Endangered Species Coalition.

According to former Air Force Chief of Staff General Thomas D. White "The mission of the Department of Defense is more than aircraft, guns and missiles. Part of the defense job is protecting the lands, waters, timber and wildlife -- the priceless natural resources that make this great nation of ours worth defending." One document lists "seven regulatory programs that impact DOD {Department of Defense} operations, training and testing in the marine environment in order of their severity" starting with the Marine Mammal Protection Act followed by the Endangered Species Act, the National Marine Sanctuaries Act, the Coastal Zone Management Act, the Magnuson-Stevens Act (protecting fish habitat) and two Clinton Executive Orders on coral reefs and marine protected areas.

Copies of the Navy documents referenced are available on request.

Endangered Species Coalition statement on Department of Defense proposed ESA exemptions.

#### The navy destroys biodiversity --- risks marine species extinction

Beans 13 (August 20, 2013, [Laura Beans](http://ecowatch.com/author/beans/) is the news curator for EcoWatch's EcoNews vertical.  “U.S. Navy to Increase Sonar Training and Underwater Detonations Despite Injury to Marine Mammals” http://ecowatch.com/2013/08/20/navy-increase-sonar-training-despite-injury-to-mammals/)

The U.S. Navy has indicated that it intends to disregard the California Coastal Commission’s (CCC) recommendations to mitigate the harmful effects of Navy sonar and offshore training exercises on the state’s marine mammals. In a letter dated July 31, the Navy responded to the CCC’s March objection, which concluded that the Navy’s planned training and testing activities in Southern California would not be consistent with California coastal law.

The Navy’s plans would allow a radical increase in sonar training and underwater detonations off Southern California, beginning in January 2014. While the Navy says it is open to negotiation, it refuses in its letter to abide by any of the state’s recommended mitigation measures, such as avoiding training in globally important foraging habitat for the endangered blue whale.

The Navy’s review comes in the wake of several new studies showing that its Southern California activities are harming marine mammal species, such as blue whales and beaked whales, far more than was previously known.

“The Navy’s plan to dramatically increase its sonar training and underwater detonations off the Southern California coast shouldn’t come at the expense of the state’s marine life,” said Michael Jasny, Natural Resources Defense Council’s marine mammal project director. “Its proposal blatantly disregards new science showing that current training levels could already be devastating California’s beaked whale populations and preventing endangered blue whales from recovering from near-extinction.” ¶“The Coastal Commission has offered reasonable measures that take into account the Navy’s need for flexibility while affording greater protection to vulnerable species,” Jasny continues. “The Navy’s refusal to adopt any of these measures puts California’s marine life in jeopardy.”

Beginning next January, the Navy plans to dramatically increase sonar training and underwater detonations off of Southern California over the next five years. The Navy estimates that it would kill 130 marine mammals outright, permanently deafen another 1,600, and significantly disrupt feeding, calving and other vital behaviors more than 8.8 million times in the process. Compared with its previous exercises in the region, these numbers represent a 1,300 percent increase.

Each year, the Navy would run more than 10,000 hours of the same high-intensity military sonar that has killed and injured whales around the globe. In addition, the Navy would detonate more than 50,000 underwater explosives off the Southern California coast. Hundreds of these explosives would pack enough charge to sink a warship, which is exactly what they’re used for.

For some species, like the magnificent gray whales that migrate up and down our coast, the incidence of harm is several times the size of their entire populations. The most vulnerable marine mammals are the beaked whales, a family of species that are considered acutely sensitive to Navy sonar, with documented injury and death. A government study published earlier this year found that beaked whale populations have indeed declined substantially in the California current over the past 20 years, and suggests that the Navy’s range may have become a population sink, making it difficult for them to breed or bring their calves to maturity.

Another Southern California study found that the Navy’s frequent sonar training poses significant risks to the recovery of endangered blue whales, whose numbers have not rebounded in the Pacific since commercial whaling was banned more than 25 years ago.

#### The Coast Guard cannot protect the environment—experts agree the Coast Guard is too busy

Schulz 10 (Sept 2, 2010, G.W. Schulz, member of the Center for Investigative Reporting, Huffington Post, “Coast Guard Resources for Protecting the Environment Fell in Recent Years”, <http://www.huffingtonpost.com/gw-schulz/coast-guard-resources-for_b_703711.html>)

The Coast Guard since 2005 has dedicated fewer and fewer resources to environmental protection, one of its myriad responsibilities that includes preventing oil spills like the BP catastrophe now making history in the Gulf of Mexico. A new report from the Department of Homeland Security's watchdog inspector general says the number of resource hours committed annually by the Coast Guard to stopping perpetrators from dumping illegally into the ocean and otherwise halting the discharge of dangerous substances dropped in 2009, continuing a trend that's lasted now for five years. Lawmakers mounted ever-increasing pressure on the Coast Guard to fight terrorism after Sept. 11 while also insisting that it maintain traditional duties the public is more familiar with, among them plucking citizens from raging floodwaters and rescuing boaters stranded at sea. Resource hours dedicated to search and rescue have also dipped since 2001, although that particular mission depends on how many people actually need help. Energy devoted to the Coast Guard's so-called "homeland security missions," which include things like securing the nation's ports and stopping undocumented migrants from entering the United States, have increased markedly since the 9/11 hijackings. The federal government defines "resource hours" as the amount of time aircraft are in flight and ships are in the water carrying out specific missions. More of those hours were spent by the Coast Guard in 2009 protecting the nation's ports, waterways and coastlines from "maritime security threats" than anything else. Marine environmental protection has been at the bottom of the Coast Guard's several missions for at least four years when using resource hours as a measurement. The IG is required by Congress to report on the division of resource hours annually. Actual incidents involving the spillage of oil and other dangerous chemicals were declining prior to the BP disaster, which may account at least in part for the fact that such environmental hazards were "not at the top of the list," as a retired Coast Guard captain described it to the Washington Post recently. The Post published an assessment of the Coast Guard Aug. 13 and pointed out that its inspectors relied on decades-old regulations when they visited offshore drilling rigs to ensure workers were adequately protected and units were seaworthy: Since the Deepwater Horizon blowout in the Gulf of Mexico, investigations into oversight gaps have focused on systemic problems within the Interior Department's Minerals Management Service, which in recent weeks has been renamed and revamped. But the Coast Guard, which shared oversight with MMS, has largely escaped scrutiny. ... Some analysts said the spill highlights the need to rethink Coast Guard priorities. In the past 35 years, Congress has handed the agency at least 27 new responsibilities, according to a tally by Rep. James L. Oberstar (D-Minn.), chairman of the House Transportation and Infrastructure Committee. 'They just don't have enough personnel to carry out all those missions,' said Oberstar, who favors severing the Coast Guard from the Homeland Security Department. 'That's just not possible.' Elevated Risk reported in May that budget plans by the Obama administration called for cutting $75 million and hundreds of personnel from the Coast Guard. That included decommissioning a strike force coordination center in North Carolina, which provides support to specialized teams in charge of handling oil spills and the release of other hazardous materials. Coast Guard officials promise the center's responsibilities will be taken over by offices elsewhere and not abandoned. Members of a key Senate subcommittee that controls the federal government's purse strings nonetheless complained in a July report that the Coast Guard's obligation to protect the environment "has been diluted by the increased demands of other homeland security missions." The panel noted a 45 percent drop overall in mission hours dedicated to marine environmental responses since Sept. 11. Obama's proposed 2011 budget also sought an increase in funding of more than $45 million for the Coast Guard to battle drug traffickers, a homeland security mission, while its search-and-rescue functions, considered a "non-homeland security mission," was scheduled to lose almost $50 million over the previous year. But many of the Coast Guard's high-profile response missions in recent months had nothing to do with the drug war. Coast Guard men and women were among the earliest to arrive in January when a colossal earthquake turned Haiti's Port-au-Prince into near rubble. Its personnel were there to free motorists and homeowners trapped during torrential May floods in Tennessee. It remains the face of Washington's response to the Deepwater Horizon explosion that killed 11 people before launching an unforgettable environmental tragedy. Recently retired Adm. Thad Allen likes to remind the public that all of these doubtlessly heroic episodes were carried out despite the Coast Guard having one of the oldest fleets in the world. He said during a February speech that two water vessels were forced to abandon the Haiti relief effort for emergency repairs and aircraft were diverted to help supply repair parts rather than participate in evacuations. One of the Coast Guard's leading preoccupations for several years now has been a gigantic, multibillion-dollar campaign to modernize its aging ships and aircraft and purchase advanced technologies. Known as Deepwater, Allen doesn't always emphasize publicly for obvious reasons that the program has suffered from serious allegations of poor contractor oversight, mismanagement and waste. The bungled handling of Deepwater has since made pleas from senior leaders for more money a tougher sell even as many acknowledge that the rank-and-file are being asked to do too much. Allen himself eventually conceded that the Coast Guard relied excessively on large defense contractors to direct Deepwater, but not before the program endured costly setbacks.

#### The navy kills marine wildlife

Walia ’14 (2/3/13, Arjun, Collective Evolution, “U.S. Navy Killing Thousands of Whales & Dolphins With Sonar & Weapons Testing”, <http://www.collective-evolution.com/2014/02/03/u-s-navy-to-blow-up-whales-dolphins-other-marine-mammals-please-take-action-now/>)

Not only have whales been showing up dead with dozens of pounds of toxic, plastic waste inside their stomachs, the U.S Navy plans to raise the death toll by conducting underwater testing of explosive weapons and sonar devices. Tests will be and are taking place in the Atlantic and Pacific oceans, including the Gulf of Mexico. These events are set to commence and take place from 2014 through 2019. The title is not an exaggeration, depending on the vicinity of the animals detonating these explosives underwater, it will kill whales and dolphin and injure many, according to two environmental impact statements released by the military.(1)(2)(3)(4)(5)(6)(7)(8)

Keep in mind, these events have been occurring for a number of years, and are responsible for the death of large amounts of marine life. (9)

The Navy is not denying these facts. They have admitted that most of the deaths would come from detonation of explosives, sonar testing or animals being hit by ships. Although I do not trust Navy estimates, according to their computer models this activity could kill hundreds of whales. The Navy said it developed the estimates by totaling the hours it will test and practice with sonar, torpedoes, missiles, explosives and other equipment for five years.  This testing will be (and already has been) responsible for the death of thousands.

According to Green Peace, government estimates are calculated at 138,500 whales and dolphins will be injured or killed.(2) There are also corporate interests here, exploration companies are allowed to use dangerous blasts of noise to search for offshore oil and gas. The U.S. Department of the Interior is considering allowing geophysical companies that work for the oil and gas corporations to use these techniques in the Atlantic Ocean, from Delaware to Florida.(2)

“There are no noise-cancelling headphones to stop the U.S. Navy’s 235-decibel pressure waves of unbearable pinging and metallic shrieking. At 200Db, the vibrations can rupture your lungs, and above 210 Db, the lethal noise can bore straight through your brain until it hemorrhages that delicate tissue. If you’re not deaf after this devastating sonar blast, you’re dead. This is the real life of marine mammals destroyed by the U.S. Navy’s all-out acoustic war on the world’s oceans. The collateral damage of this high intensity military sonar is shocking. But because all these millions of dying whales or dolphins are too often out of human sight, they’re also out of mind” (8)

Just like Orca researcher Ken Balcomb calls it, this is “acoustic holocaust.”  Scientific American calls military sonar a brutal and inhumane death sentence (4)

According to National Resource Defense Council (NRDC) policy analyst  Michael Jasny, a study published in the Proceedings of the  Royal Society B shows that even mid-frequency noises disrupt feeding patterns in baleen whales and could negatively affect entire populations. The NRDC cites multiple mass strandings on beaches after sonar has been used, including 200 beached melon-headed whales in 2004 off the coast of Hawaii, one of many examples.(6)

The Navy has rejected any suggestion to limit their sonar and weapons training.  There is a lot more information on this topic, nothing is hidden and everything is out in the open. This is happening, and it is killing a large amount of marine life.

Whales, dolphins and other marine mammals use sound to navigate, to locate each other over great distances for a number of reasons. Human technology is now drastically changing, damaging the delicate web of life and threatening life. Marine life is constantly dying, high intensity sonar alone used by the military can emit sounds as loud as a rocket blasting off. Offshore oil and gas exploration also make intense bursts. Imagine a day in your life disrupted by excruciating sound, sound so loud that it paralyzes you and your ability to function.

### Can’t Solve Arctic

#### Military is unable to operate in the Arctic—no equipment, skills, or funding

Klauss 12 (April 28, 2012, Nicole Klauss, award winning journalist specializing in the Coast Guard, Kodiak Daily Mirror, “US Navy lacks ability to operate in Arctic, games reveal,” <http://www.adn.com/2012/04/28/2444408/us-navy-lacks-ability-to-operate.html#storylink=cpy>)

KODIAK -- In six oceans, the U.S. Navy is considered the master. In the seventh, the Arctic Ocean, it will rely on others. As global warming opens the Arctic Ocean to commercial and industrial traffic, the U.S. Navy is pushing to catch up with Russia, Canada and even Denmark in its Arctic ability. If a crisis were to happen now, the Navy lacks the ability to act in the Arctic without the help of one of those countries or the Coast Guard. Last year, the Navy asked the War Gaming Department of the U.S. Naval War College to find out what the Navy needs for sustained operations in the Arctic. In the resulting 2011 Fleet Arctic Operations Game, the Navy learned how big its Arctic shortcomings are. As a force, the Navy lacks everything from bases and Arctic-capable ships to reliable communications and cold-weather clothing. While the Hollywood image of a war game involves commanders pushing ships around a table in response to threats from another country, an operations game looks at smaller threats. A group of 88 people, including industry experts, government officials and senior-level naval officers, participated in the game last September. "We looked at search and rescue, oil spill response, maritime domain and maritime safety and security issues," said Walter Berbrick, assistant research professor in the War Gaming Department at the Center for Naval Warfare Studies. "They were all fictional scenarios." The game's conclusions: The Navy is not adequately prepared to conduct long-term maritime Arctic operations; Arctic weather conditions increase the risk of failure; and, most critically, to operate in the Arctic, the Navy will need to lean on the U.S. Coast Guard, countries like Russia or Canada, or tribal and industrial partners. To sustain operations in the Arctic, the Navy needs ice-capable equipment, accurate and timely environmental data, personnel trained to operate in extreme weather, and better communications systems. Much of the environmental data will come from other Arctic nations. "We have limited capability to sustain long-term operations in the Arctic due to inadequate icebreaking capability," Berbrick said. "The Navy finds itself entering a new realm as it relates to having to rely on other nations." In the past 30 years, the Coast Guard has been on point leading maritime Arctic operations, but as the Department of Defense develops more of an interest in what is going on in the Arctic, the Coast Guard -- a part of the Department of Homeland Security -- will work closely with the Navy to share information. "It's very likely that whatever operation goes on up there would be a joint operation," said Coast Guard Capt. Craig Lloyd, chief of response for the 17th Coast Guard District. "All of the Department of Defense and U.S. Northern Command is interested in what is happening in the Arctic." Navy submarines have visited the Arctic on an irregular basis for the past half-century, sailing under the Arctic ice to test equipment and conduct classified missions. Last spring, the Navy's submarine fleet brought its newest submarines, the Virginia-class USS New Hampshire and the Seawolf-class USS Connecticut, to an organized exercise beneath an ice station. The next such exercise has been scheduled for 2013. Surface ships are rarer in the Arctic. The Navy participates in the joint Northern Edge exercise in the Gulf of Alaska during odd-numbered years. In 2009, it brought the aircraft carrier John C. Stennis north. Last year, the cruiser USS Lake Erie and destroyer USS Decatur came north. Trips to the true Arctic -- defined as north of the Aleutian Islands -- are still more infrequent, due to a lack of icebreakers. The Navy turned over its last icebreaker to the U.S. Coast Guard in 1966. In an Arctic emergency, the Coast Guard has some resources in place and might take a lead role over the Navy. The Coast Guard routinely sends a Coast Guard C-130 from Kodiak to the Arctic to patrol and it has relationships with people who live and work in the Arctic. During the summer the Coast Guard conducts operations in the Arctic to prepare for law enforcement, oil spills and search and rescue. This summer, the Coast Guard will deploy cutters to the Arctic Ocean for regular patrols. Navy officials understand the need to conduct exercises in the Arctic so they can get ready for the real thing but they don't have a strategy. "We are the only Arctic nation without an Arctic strategy," said U.S. Navy Cmdr. Blake McBride, Arctic affairs officer for Task Force Climate Change. "The Coast Guard and Department of Defense are working on a strategy to help answer the issue and advocate for capabilities." Aside from signing National Security Presidential Directive 66, which requires the U.S. to have a presence in the Arctic, the Arctic hasn't been a priority for the U.S. government, largely because there isn't an immediate military threat. "It's becoming a higher priority but we don't make our own priorities," McBride said. "We don't foresee a military threat in the Arctic but it doesn't mean we will not need to be able to operate there." The Navy's future plans to conduct operations in the Arctic largely depend on the budget. "It's all about the money," McBride said. "If you don't have the budget or funds to invest in manpower and equipment, then you don't have anything." The Navy has an "Arctic Roadmap" that discusses the Navy's plans for the Arctic through 2014. Navy officials have done the work called for in phases one and two of the roadmap, which largely consisted of developing research, assessing fleet readiness, completing capabilities-based assessments like the Fleet Arctic Operations Game, and formalizing cooperative agreements. The biggest hurdle comes in the next phase, which calls for funding equipment and Arctic training. Navy officials say they are drafting a budget request to address those items.

### AT: Military Key to Technology Development

#### The military isn’t key to private sector spillover—Agriculture, wind, solar, and biotech prove

Jenkins et. al ‘10 Researcher at the Massachusetts Institute of Technology (December 2010, Jesse Jenkins, Devon Swezey, Yael Borofsky, Helen Aki, Zachary Arnold, Genevieve Bennett, Chris Knight, Ashley Lin, Teryn Norris, Taj Walton and Adam Zemel, “WHERE Good TECHNOLOGIES COME FROM”, http://thebreakthrough.org/blog/Case%20Studies%20in%20American%20Innovation%20report.pdf)

AGRICULTURE

For nearly a century, hybrid seeds and agrichemical technology have dramatically increased agricultural yields and reduced food prices. Early public initiatives to decentralize agricultural research along with sustained federal investment in agricultural science and technology made these innovations possible.

In the mid-19th century, agriculture formed the backbone of the American economy with half of the U.S. population living on farms and 60 percent of all jobs connected to agriculture. Most U.S. farming families, however, were uneducated and had little access to practical and technical training.

Recognizing the economic importance of agricultural resources, Congress established the Agricultural Division of the Patent Office in 1839 to collect, distribute, and research new varieties of seeds and plants. The new agency became the main repository for genetic plant material in the country.

Over the following decades, the government built a foundation for modern agricultural science along with the widespread diffusion of future agricultural innovations.

In 1862, Congress passed and President Lincoln signed the Morrill Land Grant College Act of 1862, providing states with land that they could sell to develop agricultural colleges where new agricultural and mechanical practices would be taught. Notable institutions including Ohio State University, Iowa State University, and the University of California system, among others, all originated from the Morrill Act. Later, in 1887, Congress passed the Hatch Experiment Station Act, which funded and expanded a system of state agricultural experiment stations (SAESs), to provide a stronger scientific and research base for professors at those schools.

To ensure the diffusion of new scientific knowledge generated in the colleges, Congress passed the Smith-Lever Act in 1914, creating the Cooperative Agricultural Extension Service –a partnership among federal, state, and county governments. Extension services informed farmers of new research and technological advances relevant to their crops and local conditions, helping them to continuously boost productivity.

Together, the Morrill, Hatch, and Smith-Lever Acts transformed U.S. agriculture into a scientific and technological enterprise and the research funded through agricultural extension services provided enormous benefits to a growing station. The development of double-crossed hybrid seeds, made practical by maize geneticist Donald F. Jones at the Connecticut Agricultural Experiment Station, dramatically boosted yields and improved economic prospects for legions of American farmers. In 1934, less than one-half of one percent of U.S. land planted in corn was sowed with hybrid seed. By 1956, virtually all corn planted in the United States was hybrid corn.

Until World War II, agriculture continued to enjoy a privileged position in U.S. science and technology policy, accounting for 39 percent of federal R&D spending in 1940. Early federal investments in agriculture also spurred the growth of industry-funded R&D, which today exceeds that of the public sector. By supporting valuable agricultural knowledge and technologies, the public sector laid the foundation for the vibrant agribusiness industry that exists in America today.

Together, this public-private partnership drove innovation and productivity improvements that facilitated dramatic increases in agricultural production, even as harvested cropland and the number of people employed in the field has declined. From 1920 to 1995, harvested cropland declined from 350 to 320 million acres, the share of the labor force in agriculture declined from 26 percent to 2.6 percent, and the number of people employed in agriculture decreased by two-thirds to 3.3 million, all while agricultural production tripled.

By dramatically expanding agricultural productivity, government investment in scientific research, education, and technology adoption helped move America away from an agriculture-oriented economy and into the industrial age. It also led to the creation of some of the most important centers of research and learning in the country today.

COMMERICAL WIND POWER

Rising high above the cotton fields in the town of Roscoe, Texas, (population 1,300) 627 wind turbines make up what is currently the largest wind farm in the world. At 781.5 megawatts, the massive wind project supplies power to more than 250,000 Texan homes. Organized by a local cotton farmer from Roscoe, the farm is just one of many wind energy projects reviving the local economies in West Texas and throughout the United States.

It is not just the United States getting in on the wind energy action; wind energy is one of the fastest-growing energy industries in the world, and is expected to remain so over the next decade. Globally, the industry has grown from 17,000 megawatts in 2000 to 160,000 megawatts in 2009, an annual growth rate of nearly 29 percent.

The modern industry has changed dramatically from its humble beginnings in the early 1970s, when the public response to oil crises and environmental concerns prompted a renewed look at the technology. Over the subsequent decades, technological innovation in the sector proceeded quickly; from 1980 to 1990, the cost of wind-generated electricity declined by a factor of five, from 38 cents per kilowatt-hour to eight cents per kilowatt-hour. Today, prices are lower still, and approach competitiveness with conventional fossil fuels in some geographic areas.

From the start, the federal government played a key role in driving technological innovation in the wind energy sector by funding the development, demonstration, testing, and deployment of new wind turbines. Federal support helped private companies like GE Wind, the world’s second largest turbine manufacturer, improve their technology and gain a foothold in early markets.

In the 1980s, the federal government pursued two different R&D efforts for wind turbine development. The first was a “big science” effort by NASA and the Department of Energy (DOE) to use U.S. expertise in high-technology research and products to develop new large-scale wind turbines for electricity generation, largely from scratch. Perhaps predictably, this effort was less successful, because it was relatively detached from the private sector and the operational experience of wind turbines.

A second, more successful R&D effort, sponsored by the DOE, focused on component innovations for smaller turbines that used the operational experience of existing turbines to inform future research agendas. This program led to substantial improvements in wind turbine efficiency during the 1980s. Joint research projects between the government and private firms produced a number of innovations that helped increase the efficiency of wind turbines, including twisted blades and special-purpose airfoils. Of that era’s 12 key innovations in turbine components, seven were funded, at least in part, by the federal government.

Publicly funded R&D was coupled with efforts to build a domestic market for new turbines. At the federal level, this included tax credits and the passage of the Public Utilities Regulatory Policy Act (PURPA), which required that utilities purchase power from some small renewable energy generators at avoided cost. Most of the market for wind turbines in the 1980s was in California, where the state’s implementation of PURPA was particularly generous, and importantly, permitted long-term power purchasing contracts, which helped reduce risk for project developers. The state government also passed state-level tax credits and conducted resource assessments to determine optimal geographic sites for wind power.

SOLAR POWER

In March 2010, American firm First Solar, the world’s leading manufacturer of thin-film photovoltaic solar cells, signed an agreement to supply one of the largest photovoltaic plants in the United States. At 550 megawatts, the plant would provide enough electricity to power nearly 160,000 homes. First Solar has stormed onto the solar scene over the last five years as manufacturing innovations and advancements in its technology have helped the firm secure a position as the global cost leader in photovoltaics. The company uses the less expensive cadmium telluride as a semiconductor for its cells as opposed to the more common crystalline silicon, and it recently brought its manufacturing costs below $1 per watt, a milestone in the field.

First Solar’s success would not have been possible had it not been for the federal government acting as a key partner in the development of solar photovoltaics (PV) – a technology industry the federal government single-handedly created by acting as the technology’s initial customer in the mid-20th century.

Solar PV technology was born in the United States, when Daryl Chapin, Calvin Fuller, and Gerald Pearson at Bell Labs first demonstrated the silicon solar photovoltaic cell in 1954. The first cells recorded efficiencies of four percent, far lower than the 25 percent efficiencies typical of some silicon crystalline cells today. At a cost of $300 per watt, more than one hundred times more expensive than typical utility electricity rates at that time, the early cells were far too expensive for wide-scale commercial adoption.

BIOTECH

The traditional story of the development of these drugs is one of scientific discovery, followed by those discoveries being exploited by entrepreneurs in the private sector and translated into new commercial drugs motivated by the pursuit of profit in the free marketplace. Absent from the traditional account, however, is the instrumental role that the federal government played in developing the modern biotech industry.

The biotechnology industry has its origins in decisions made by President Richard Nixon in 1969, to convert the nation’s well-funded biological weapons program into a bio-medical research effort. Worried about the United States’ competitive position in biological sciences relative to rivals like the Soviet Union and Japan, Nixon made a strategic decision to expand non-military research funding and diversify research efforts through universities and non-military agencies like the National Science Foundation (NSF).

Grants from NSF and the National Institutes of Health (NIH) supported the pioneering university research of Herbert Boyer and Stanley Cohen, who invented DNA cloning, now known as recombinant DNA (rDNA), a process that formed the technical foundation of the modern biotech industry. Recombinant DNA gave scientists an unprecedented degree of control over genetic material, allowing them to modify and augment existing genes to create new molecular entities (MNE’s) with potentially large medicinal benefits.

By 1976—the same year that Boyer founded Genentech—NIH was funding 123 biotech-related projects. NIH officials viewed rDNA techniques as likely to yield progress in the fight to cure cancer, and by 1987 the federal agency invested more than $100 million toward new cancer research. Encouraged by robust federal support, academic scientists as well as biotech and pharmaceutical companies viewed molecular biological research as the “research line of choice,” spurring growing private sector investments in the new field.

Under Presidents Jimmy Carter and Ronald Reagan, the government also worked to accelerate private sector commercialization of new biotech discoveries by enacting a number of important pieces of legislation.

The 1980 Bayh-Dole Act enabled scientists, universities, and corporations receiving federal research grants to patent and license their discoveries for the first time, encouraging stronger university-industry relations. Also passed in 1980, the Stevenson-Wydler Technology Innovation Act greatly encouraged the transfer of scientific discoveries made in university or government laboratories to the private sector. The law mandated the creation of technology transfer offices at all federal agencies to establish intellectual property rights and provide incentives for commercially relevant research. The Federal Technology Transfer Act of 1986 authorized cooperative research and development agreements (CRADAs) between industry and government, allowing commercial firms to draw on the unique resources of federal laboratories. These and other policies accelerated the development and commercialization of new innovations in biotechnology, along with numerous other sectors.

Since the 1980s, the federal commitment to health research has only grown. From 1995 to 2008, under both President Bill Clinton and President George W. Bush, funding for the NIH nearly tripled from $11 billion to $29 billion per year.

The impact of federal funding on the biotechnology industry has been dramatic. Of the fifteen U.S.-developed “blockbuster” biotechnology drugs (those with over $1 billion in annual sales), thirteen received significant government support for drug discovery and development or for clinical trials. For eight of the thirteen drugs, the federal government either funded research conducted in university labs, or NIH scientists made the key discoveries in government labs. These blockbuster drugs, in turn, have shaped the market position of world-class biotech firms.

It is not an exaggeration to say that the world-leading U.S. biotech industry would not have taken root without an active and robust partnership between the private sector and the federal government. Beyond the field of medicine, government investment in biotechnology has also made possible advances in agricultural production and tailored organisms enabling new industrial processes, and continues to push the limits on biotechnological innovation.

### AT: Navy Readiness DA

#### Navy sea capabilities are useless— Army and Air force solve all of the Navies missions

**Reed 7** (August 31, 2007 John T. Reed holds a bachelors degree from the United States Military Academy at West Point and a master of business administration degree from Harvard Business School. “Are U.S. Navy surface ships sitting ducks to enemies with modern weapons?” http://www.johntreed.com/sittingducks.html)

Militant stepchild

**The Navy has long been a sort of stepchild in the American military.** And it has been a very militant stepchild throwing such ferocious tantrums that it was able to get its own air force—Navy carrier-based planes—and its own army—the U.S. Marine Corps. Not only does the Navy have its own army and air force, the Navy’s army—the Marine Corps—has its own air force, too. (Astronaut and later Senator John Glenn was a Marine pilot.) Unbelievable.

It should be noted that the Army does not have its own air force or navy. (The Army needs its own helicopters and small fixed-wing planes because they work very closely with ground units in combat.) Nor does the Air Force have its own army or navy. **The missions of the Navy pilots** could just as easily be carried out by Air Force pilots **trained to use carriers as their base.** The Army could perform, and does perform, the functions of the Marine Corps.

Marines

The Marine Corps was originally a bunch of soldiers stationed on ships to board enemy sailing ships and/or to repel boarders from the enemy sailing ships. Those tactics went the way of the wooden sailing ships 150 years ago.

**The Marine Corps** then **claimed it was needed for amphibious operations. But the biggest amphibious operation ever—D-Day—was all Army—no Marines.** The Marines did famously engage in amphibious operations in the Pacific in World War II, but they screwed up Tarawa pretty good and when they mastered the amphibious landing, there was no indication they were much better at it than the Army was in Europe. Also, it is an extremely limited role. **The earth has a lot of water and a lot of land, but relatively few beaches.** Then there is the whole idea of whether amphibious landings are a sensible way to wage war in the Twenty-First Century. They bear too much resemblance to the Charge of the Light Brigade and Pickett’s charge at Gettysburg.

The Marines continue to exist because they scream bloody murder whenever anyone points out that they do not have a separate mission from the Army. According to a 3/09 Baltimore Sun story, the Marine Corps Commandant urged the Marines to “...take the major ground combat role in Afghanistan...” Afghanistan is a landlocked country—no coast.

I would let them continue to exist and wear their distinctive uniforms in recognition of their history and espirit de corps, but I would make them a subsidiary of the Army, not the Navy, and their mission would be like that of the Tenth Mountain Division: a specialized Army unit (although a 10th Mountain Division veteran told me the 10th Mountain Division is a mountain division in name only. They have no training or equipment for that role.)

‘What business are we in?’

At Harvard Business School, the most-commonly-asked question as we analyzed actual business cases from the perspective of the executives of the company was, “What business are we really in?” For example, manufacturers of printers and copiers are really in the toner business.

The most famous article ever printed in the Harvard Business Review was called, “Marketing Myopia.” It said too many companies defined what they do incorrectly, usually overly narrowly. The classic example in the article was that the railroad companies generally failed because they did not realize they were in the transportation business, not the railroad business. When interstate highways and trucks ascended, the railroads regarded those technologies as the enemy. Had they thought of themselves as being in the transportation business, they would have embraced motor vehicles and highways and integrated them into their existing railroad capabilities.

#### Navy does not protect sea lanes or solve piracy

**Reed 7** (August 31, 2007 John T. Reed holds a bachelors degree from the United States Military Academy at West Point and a master of business administration degree from Harvard Business School. “Are U.S. Navy surface ships sitting ducks to enemies with modern weapons?” http://www.johntreed.com/sittingducks.html)

They really are in the business of securing international waterways to prevent enemies from using them to attack us and enabling our military to use international waterways to attack overseas enemies. (A career Navy reader told me the U.**S. Navy also protects merchant vessels. No, they don’t. They tried in the Gulf of Aden to prevent piracy but the piracy continue**s, but grade school dropouts in zodiacs. **The oceans are too vast, the number of merchant vessels is too great, few are U.S.-flagged because of U.S. maritime union greed, and the Navy ships are too slow to respond to merchant 911 calls. You need air craft to do that**, also,) That being the case, the Navy should either make much more use of aircraft or cede the role to the Air Force. **The role of ships in the world has been greatly reduced, especially in modern war.** In other words, it may be that the Navy actually needs its own air force. What the **Navy may not need is its own navy.**

At the outset of World War II, many erroneously thought that the battleship was the main naval warfare instrument. They quickly learned what the Japanese had already figured out. The aircraft carrier was the main weapon. Sixty years later, the U.S. Navy still thinks the aircraft carrier is the main naval weapon. Nonsense. Carriers became obsolete in the mid 1950s because of long-rang land-based bombers and missiles. In modern warfare, the ship is a sort of floating Maginot line.